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Taking a Chance

Soon after graduating from Plattsburgh State University, a man named Mike Rose decided to roll the dice and gave me my first job out of college as a local sports reporter for the *Journal News*. About 18 months later, a woman named Holly Sraeel took a flying leap and hired me to report on banking for *US Banker* magazine (now *American Banker* magazine). I had no experience in the space, but I guess she saw something. About two years later, a man named Phil Albinus took a chance and hired me to write about technology—something I hadn't covered before—for this here magazine. And a little while later, it was Victor Anderson, who had taken the reins as editor-in-chief of *Waters*, who put his faith in me. I'll never forget that first conversation with my new boss. He said: "Tony, I want you to get three of the most influential technologists on Wall Street for the cover of our magazine." I was about three months into the job here at *Waters*, and I needed a drink.

I hope these individuals who took a chance on me feel that I served them well. I know that I am forever indebted to them, and I wouldn't be where I am today without their help and guidance. And where I am today is taking over as the editor-in-chief of *WatersTechnology*. As many of you know, Victor Anderson has transitioned into a new role, now serving as global content director on the commercial side. It's been a pleasure working with him all these years and I look forward to partnering with him going forward.

Prior to being named editor-in-chief, I had carved out a role for myself as something called editor-at-large. I was the US editor for many years, but I wanted to simply focus on reporting on big, meaty stories. That role will now fall to Max Bowie. Anyone who has ever been exposed to *Waters* and, specifically, *Inside Market Data*, knows who Max Bowie is—he's damn near a legend in the market data space. He will now get to focus on what he loves most—reporting on interesting, exclusive stories and providing guidance to the other reporters on staff. You will also notice a new—but familiar—face in this issue: Jo Wright. Jo was a reporter on *Inside Reference Data* for about two-and-a-half years. She then joined sibling publication *Risk.net*, but we stole her back and this is a big win for us. You can read her first column for us on page 99. Going forward, she will serve as our UK editor, overseeing the day-to-day operations of our London bureau, joining Wei-Shen Wong, our star Asia editor.

I've been with *Waters* for almost a decade and I'm very excited to assume this new role. It will be challenging, but I am taking over something that has been on the way up for a long time. But the only way I will succeed—that we will succeed—is if we serve you well and deliver the kind of news and features that will help you do your job better.

So once more, I'm asking someone else to take a chance on me—you. I'd love to hear from you about how we can improve and serve you better. Please do not hesitate to call (+1 646 490 3973) or email (anthony.malakian@infopro-digital.com) with any thoughts, questions or concerns. I look forward to hearing from you. wt

Anthony Malakian
Editor-in-Chief

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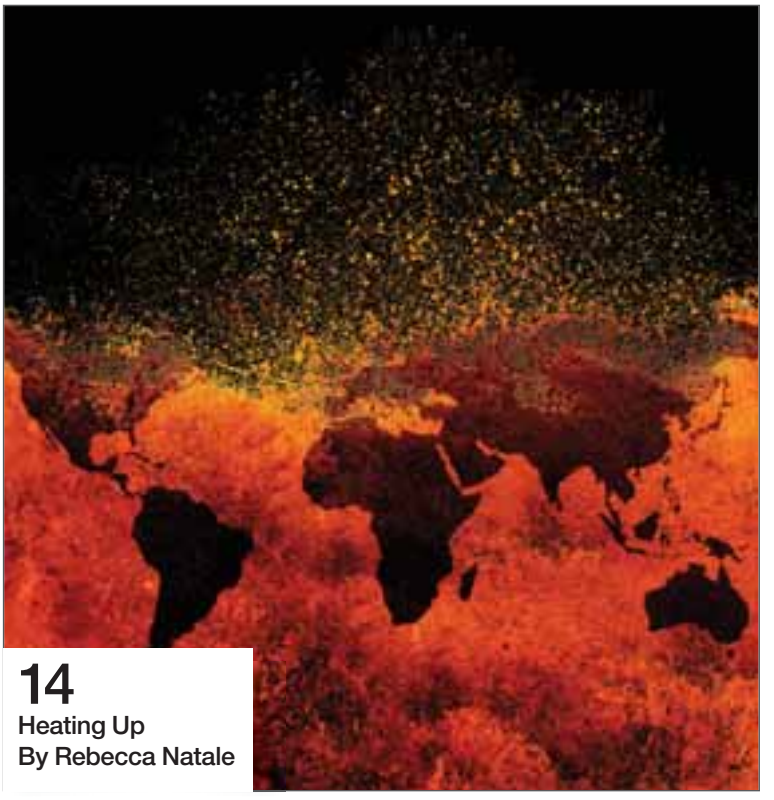

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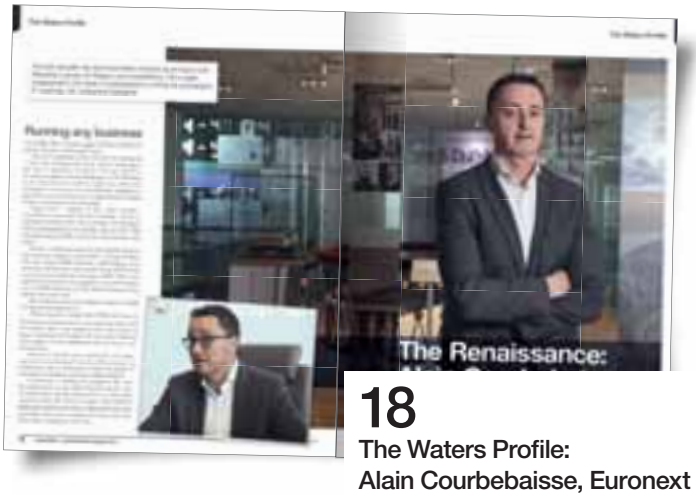

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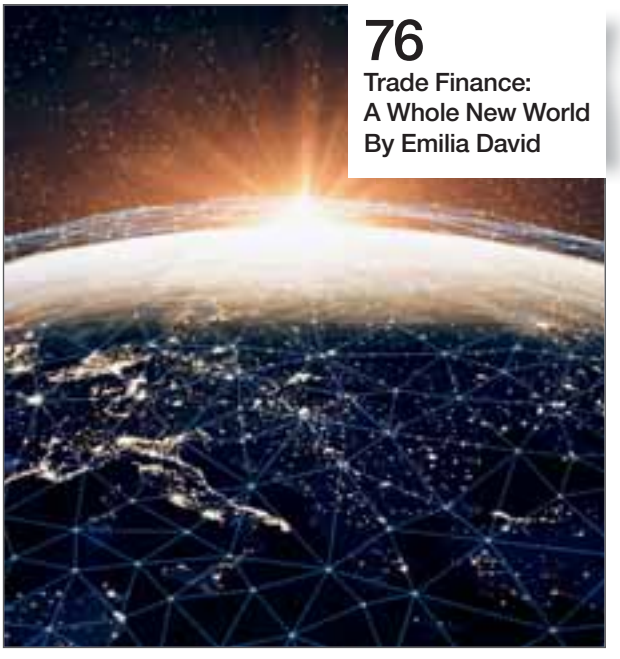

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Itiviti Looks to Capitalize on Bloomberg's SSEOMS Exit

Itiviti's new CEO says there are 79 roles the company is looking to fill to help fuel its future growth.
By Wei-Shen Wong

Swedish trading and technology provider Itiviti is making preparations in the hope that it will win over new clients migrating off of Bloomberg's Sell-Side Execution and Order Management Solutions (SSEOMS) unit.

Since *WatersTechnology* broke the news about Bloomberg's planned exit of its SSEOMS and KYC business units, Itiviti has received commitments from SSEOMS clients to use its multi-asset order management system (OMS), says Robert Mackay, the vendor's CEO. To help win those potential converts, it is looking to build out its capacity to better handle migration projects.

"Given the commitments we have already, we're going to have a substantial increase in our implementation projects in the second half of this year," Mackay says. "Rather than deal with that problem later in the year, I want to make sure we have the capacity available now because it's abundantly clear we're going to have a rush of projects in the second half and into next year."

There is a degree of coordination required to make sure Itiviti is able to spread the migration projects evenly through to the end of 2020. To help with this, Itiviti is taking on some staff from SSEOMS to help smooth that process out. Itiviti, as a whole, is looking to fill 79 roles—the majority of which are client-facing—to assist with the company's growth plans.

"We'll be getting a variety of talent from the SSEOMS organization into those roles," he says. "Well, frankly right now, we'll take as many SSEOMS staff as we can. Clearly, a number of them have found roles within Bloomberg, which is great. But for those that haven't or for those who have been working with customers of SSEOMS that are open to join us, we're delighted to bring them on board. We need support teams, implementation teams, and professional services staff."

Out of the 170 customers or so using Bloomberg's SSEOMS, Mackay says Itiviti is in discussions with almost all of them at various stages. While a number of them are not yet at the commitment stage, some have already agreed to adopt Itiviti's OMS.

"For those that are [migrating to Itiviti's OMS], we'll start on those projects earlier. For those that aren't, we need to be transparent with them and be clear about when we have the capacity in terms of time and when we're booked up. It's a scheduling problem and we're being fairly transparent with our clients," he adds.

The migration will require no development work, Mackay says. It will only involve existing functionalities, which could mean some building of customized user interfaces and specific workflows, where necessary.

"The most important phase of a potential implementation is requirements gathering, where we have our professional services staff—both technical and financial—working with the clients to flesh out what interfaces are going to be built, if any, and what workflows we want to implement, understanding the scope of the project and then agreeing on a project plan. We put our joint team in place to go execute on that," he says.

Mackay explains that some of these projects should be fairly straightforward, such as for the trade files it will need to generate, and the back-office interface. "Again, front-to-back office interfaces are not too complex. There is nothing in these projects that gives us undue concern. We haven't hit any major hiccups. They are fairly cookie-cutter projects. But, you know, we don't know exactly how every client is using SSEOMS, and inevitably there are wrinkles along the way and there are clients who may be using SSEOMS in fairly non-standard ways. When we come across some of those we will have to deal with them," he adds.

Robert Mackay
Itiviti

The migration process could last up to six months, Mackay continues. "Given that we're onboarding people who know SSEOMS very well, that's designed to give clients far greater confidence and comfort throughout that migration process," he says. "We have projects in flight right now, which we will announce soon."

Market data is another focal point for Itiviti. SSEOMS, as part of the Bloomberg empire, came bundled with that data, but Mackay says that his firm is market data agnostic, so clients will be able to feed it in from various sources.

Because market data came bundled into the SSEOMS offering, data costs were contained. As a result of Bloomberg's planned exit of the unit, it might end up hitting current customers in the wallet, but he does not believe it will be prohibitive.

"Clients have a fairly clear expectation that replacement solutions are typically going to cost rather more than they were spending on Bloomberg SSEOMS," Mackay says. "I think there's a reasonable expectation of price upticks from the current spend, but we don't think it's anything too unreasonable." wt

Rimes Eyes Custom Solutions with New Portal

The vendor is revamping its user experience to allow for greater customization. By Anthony Malakian

Managed data and regtech services provider Rimes Technologies is rolling out a new client portal to its user base—a major shift for the company, and its first step towards providing custom solutions, officials tell *WatersTechnology*.

"Through this enablement, we can now begin to bring full self-service functionality for elements that clients have been asking for, for a very long time," says Shaun Mirams, global head of business transformation at Rimes. "Historically it's been very hard to allow the client to drive the process because of integrity and the complexity of the platform. What we've done now is fully integrate the website into the platform, and all that complexity falls away. So the clients will be more enabled to do some of the things they've been asking of us for a very long time, particularly for [benchmark] blending and to edit their own information."

The new online service has a substantially consolidated user experience that combines its entire product suite and its data platform into logical business process flows, he says. It delivers intelligence across more than 1,000 databases, accounting for about 3.5 million benchmarks and more than 70,000 data feeds per day.

The vendor's old client portal was constructed about 15 years ago. While it had undergone numerous updates, those updates were particular to a function or process. Mirams says the new client service portal boils down the existing 1,000-page site to six or seven pages that are optimized for a particular business function, rather than optimized for a product or a perspective.

"Up until now, we haven't really spent the time to do a full end-to-end assessment of the website in terms of the expectations of consumers for more

The new portal allows clients to work with real-time data

intuitive workflows; an ability to find things quickly; and an ability to leverage all the functionality that we have built over time and expose it to the client," he says. "Historically, the technology didn't allow us to do that."

The new portal allows clients to work with real-time information, and makes it easier to search and access financial data through its feed manager. Until now, the feed process has been a "fairly passive" one, Mirams says, insofar as the client has a screen that allows them to see which data feeds are running, and which have failed.

In the past, when a feed failed, the first thing the client would do is email Rimes to ask what happened. Until now, Rimes hasn't provided sufficient information through its existing portal to help end-users understand exactly why a feed failed and to fully understand the actions that need to be taken to correct the problem.

"Through the last four years, we've had about 67,000 of those emails come through asking us why that feed has failed," Mirams says. "Why, when, how and who are the four things that we get asked the most regarding feeds. So, in order to be able to optimize that communication cycle between an end-consumer and their support person, [and] their support person and the Rimes service desk, the easiest way to circumvent the process is to expose more information to everybody on the client side. So they can see exactly what has happened, why it happened, actions that we are taking, and then expectations of when that feed could come."

This information is delivered in real time, rather than replication updates occurring every 30 minutes or so. As a result, it allows for a more active feedback process, rather than passively looking at a screen that has time-lag updates. Mirams says this is why the company changed the application's name from Feed Monitor to Feed Manager: "Conceptually it's moved from being an application that is passive—as far as the user is concerned—to an application that is active."

This will also allow users to save time. During beta testing, clients indicated that for every 15 minutes that Rimes saves through dealing with failed events, they are seeing a time savings of three times that amount.

And because Rimes has aligned all of its products using the same architecture, and the website is physically connected to the Rimes platform, the vendor will in future be able to allow greater customization regarding how users interact and distribute information. "It's the first step toward custom solutions," Mirams says.

With this rollout, the new portal will also include the ability to subscribe to new micro-products and services. The landing page also comes equipped with insights, events, and news from Rimes, as well as a new vendor reports solution that is customizable. Rimes says it will provide training and documentation to support the introduction of the new environment, led by its business transformation team. wt

ICE Creates Daily Credit Risk Monitoring Tool

The company is muscling into Bloomberg's fixed income data territory with a new bond analytics service. By Robert Mackenzie Smith

ICE has launched a tool for investors to measure the creditworthiness of bonds on a daily basis, further bulking out its burgeoning credit franchise and pitting itself against Bloomberg.

The exchange and data service provider has set up the new suite of analytics, dubbed ICE Credit Risk, in its ICE Data Services division. The firm says it will provide investors with "faster signals for monitoring early deterioration or improvement of credit".

Launched on May 8, it combines a daily credit analysis of 40,000 individual publicly rated and non-publicly rated bonds with a monthly report on credit fundamentals by Credit Benchmark, a third-party, consensus-based credit analytics company.

"This is another core set of analytics that we're bringing to market to really increase transparency around the fixed income universe," says Lynn Martin, president and chief operating officer at ICE Data Services.

ICE hopes the product will stand out based on its ability to analyse underlying securities versus just giving a credit overview of the company issuer.

"The relative liquidity of debt underneath an issuer is going to have a different profile. That's why we think taking the metrics alongside our liquidity scores will really give someone a comprehensive view of the risk and liquidity profile of an individual security," says Martin.

Aimed at investors, ICE Credit Risk hopes to attract those dissatisfied with the timeliness and coverage of credit analysis currently available in underlying bonds.

Today, many investors rely on fundamental research of particular securities via credit rating agencies, credit default swap spreads, trade information or internal analysis to scrutinise securities, ICE executives say.

Lynn Martin, ICE Data Services

Mike Nappi, an investment grade corporate bond trader at Eaton Vance, says ICE's new tool could prove useful so long as the securities included within the service are not just focused on the most easily digestible names.

"We spend a lot of time doing credit analysis *ad hoc*, and to think we can look at something and get an answer quickly is welcomed," he says. "But it's not so much about the number of Cusips a service may have, and more about having a really wide net. If 95% of the names in an index are covered, then that's more important than the Cusip number."

ICE Credit Risk will also incorporate its own Liquidity Indicators product, which provides information about the level of liquidity in bonds and analyses investors' ability to exit those positions in the marketplace.

By aggregating these fixed income data sources, including the fundamental analysis from Credit Benchmark, some believe it will put ICE in direct competition with Bloomberg's BVAL credit monitoring tool, which currently spans more than 200,000 government, supranational, agency and corporate bonds, as well as one million municipal bonds.

"This product is very similar to what Bloomberg's current product offerings already include," says Zack Ellison, a former credit trader at Deutsche Bank and Sun Life Investment Management, and currently a fintech-focused consultant and venture capitalist at Applied Real Intelligence in Los Angeles.

With ICE pulling together a number of different systems to create its new offering, Ellison says it's important for all of the parts to be up to scratch.

"The value-add for most traders would be as an aggregation tool that enhances efficiency—but in this context it's only really going to be useful if every component is good. So in that sense, it's all or nothing," he says.

The decision to aggregate these credit data services builds on ICE's recent moves in the fixed income space. In January 2018, it purchased electronic bond trading platform Virtu BondPoint for $400 million, adding it to its portfolio of credit trading products that include Creditex, ICE Credit Trade, NYSE Bonds, and BondEdge.

ICE also acquired Standard & Poor's Securities Evaluations and Credit Market Analysis businesses in 2016.

Executives at the firm hope that ICE Credit Risk will also prove useful for asset managers juggling requirements around the US Securities and Exchange Commission's liquidity rule and the new International Financial Reporting Standard 9.

The latter requires pension and insurance firms to understand the expected loss of an investment over time rather than just at the point of loss, while the SEC requires mutual funds and exchange-traded funds to enact a programme to manage and report liquidity-limit breaches to the regulator and the fund board. wt

DTCC Chief Predicts Substantial Change to Market Infrastructures Within a Decade

The Depository Trust & Clearing Corp.'s Michael Bodson predicts technology will fundamentally change how the markets work. By Emilia David

The head of one of the largest financial market utilities in the world is predicting that current market infrastructures will not exist in their current form in just 10 years as technology starts to change how the business operates.

Michael Bodson, CEO of the Depository Trust & Clearing Corp. (DTCC), said during the company's annual Fintech Symposium in New York that the rise of a more technology-focused client has fundamentally shifted how people interact with market infrastructures.

"I'm certain beyond a doubt that the market infrastructures of today will not exist in their current form 10 years from now, if not sooner than that," he said. "I say that with confidence because we're at the start of a great transition for financial services. It's the dawn of a technology revolution in which the emergence of digital platforms, the rise of APIs, an oncoming generational shift and advances in organizing data under management are transforming expectations, reordering priorities and altering the complexion of the industry."

He added the industry is now at an "inflection point," that will have a "profound impact on the future of banking."

New Technologies

Bodson was referring to the range of emerging technologies that the industry—and the DTCC—are exploring, such as APIs and machine learning. These technologies are everywhere now, he said, and it is imperative that companies such as the DTCC find their way to work with these innovations.

Michael Bodson
Depository Trust & Clearing Corp.

The company, Bodson said, is in the process of expanding its external API marketplace to connect more of its clients to third-party APIs within the DTCC platform. The utility already has an internal API marketplace which it launched in June 2018 and allows access to APIs in one central location.

Generational Shift

Part of the reason these technologies are changing the landscape is how ingrained they are becoming within the culture of the workforce and its client base. He talked about a generational shift facing banks and the financial sector, with potential clients and employees who are used to the convenience the digital world offers.

"The digitization of finance and this generational shift will represent a significant challenge for traditional banks that focus on a soft-touch approach but lack great apps to provide a seamless client experience," Bodson said. "We've been forewarned—we're facing a serious challenge to the status quo."

To meet this challenge, Bodson said, the DTCC is committed to using technology including data science, machine learning and artificial intelligence to help its clients better understand their data.

But not all emerging technologies have reached their full potential, he suggested. The impact of distributed-ledger technology, in particular, so far remains "elusive," he said, though its potential is "undeniable." The question is whether its "enormous power to transform financial services will ever be fully harnessed." wt

THE NEW TIW

One of the more ambitious market-structure projects utilizing blockchain is now complete and is set to go live by the end of the year, according to executives at the DTCC.

The Trade Information Warehouse (TIW), which handles lifecycle events in the majority of trades in the $12 trillion credit derivatives market and is operated by the DTCC, will be implemented around the middle of the fourth quarter of 2019.

"We've been undergoing a period of robust testing," Jennifer Peve, managing director of business development and fintech strategy at the DTCC, told *WatersTechnology* back in March. "We've been very pleased with the results so far, particularly given that this is such a nascent technology."

The platform, which was built by IBM and Axoni, with industry distributed-ledger technology consortium R3 acting in an advisory capacity, has been under development for some time, and its release has been continually pushed back. *WatersTechnology* reported in September 2018 that the project was scheduled for an early-to-mid-2019 launch, after it had failed to meet previously suggested go-live dates stretching back more than a year.

However, the project is not being developed in isolation. Along with industry participants testing the platform—the first proof-of-concept test was conducted in April 2016 between the DTCC, IHS Markit and four banks—there are also other firms relying on its implementation in order to release their own technology revamps. IHS Markit, for instance, through its MarkitServ division, is planning to integrate with the TIW as part of the introduction of its next-generation TradeServ platform.

CAT Rollout Moves Forward Following Processor Change

Finra and the SEC are working on identifiers that mask personally identifiable information. By Emilia David

With a new consolidated audit trail (CAT) plan processor in place, implementation is ticking up.

In February, it was announced that the Financial Industry Regulatory Authority (Finra) would take over as the CAT plan processor, taking the reins from Thesys CAT, which was ousted by the consortium of US stock exchanges responsible for its implementation. The regulator has since created a separate company to oversee the CAT as Finra is one of the organizations that will be reporting and receiving CAT data.

During a panel at this year's Securities Industry and Financial Markets Association (Sifma) Operations Conference, Judy McDonald, associate director of technology at Susquehanna International Group, said she believes the industry is moving more quickly toward building the CAT and that there is more transparency in the process.

"It has been a positive change and we've seen changes come about much faster. Our discussions have been deeper and we've seen a more experienced approach from Finra, including a very transparent, well-thought-out framing of the technical documents."

She added that Finra CAT—the new entity created by Finra to oversee the database—has also started looking for people to fill key positions, including that of CTO.

Thesys CAT was removed as processor in January after a series of delays. The CAT was supposed to go live in November 2017.

On the Sifma panel, Finra CAT CEO Shelly Bohlin pointed out that Finra will proceed with the same technical specifications that were developed on the Thesys-built system. The new entity, however, has moved forward with its own roadmap and timeline, including the April 2020 large broker-dealer equity reporting date, which was previously reported by *WatersTechnology*.

Development of the CAT is progressing more quickly

> "Our discussions have been deeper and we've seen a more experienced approach from Finra, including a very transparent, well-thought-out framing of the technical documents"
> **Judy McDonald, Susquehanna International Group**

She said Finra CAT has so far received 300 registrations since March. Finra estimates around 1,700 firms will have to report to the CAT.

Security Concerns

Finra CAT and the Securities and Exchange Commission (SEC) have begun the process of figuring out an identification system that aims to protect personally identifiable information (PII), particularly social security numbers. The CAT is working on a Firm Designated ID (FDID) to keep track of reporting firms. While the FDID tracks customer accounts, no actual account numbers are linked to it. The SEC, on the other hand, will have what it calls a CAT Customer ID, or CCID, created using social security numbers.

Essentially, the SEC will assign the CCID using social security numbers to generate the ID, but only the end product—the CCID—will be visible in the CAT system; the social security numbers that refer to the CCID will be kept in the SEC's databases and will not be visible in the CAT, said Manisha Kimmel, SEC senior policy advisor on the CAT, during the event.

"The CCID is important because it's the cross-market identifier. The fundamental goal of the CAT is to be better than what we have now, so we need a cross-market identifier," Kimmel said. "The most-sensitive piece of information, social security numbers, will not be in the CAT at all."

PII has been an ongoing concern for the industry considering the sensitivity of the information the SEC demands and the cybersecurity problems that have beset the regulator.

The SEC has promised lawmakers that customer and trader information will be safe but is largely hands-off in CAT development. SEC commissioner Robert Jackson said in a separate panel during the conference that PII protection is the industry's responsibility.

"The industry can get together to figure out how to protect the information that we need. I think PII is solvable if the market comes together as a community," Jackson said. "All the SEC can do is to tell the industry to step up, and we have done all that we can to push the CAT forward. We think we're going to see the process really move forward by the end of the year." wt

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Using APIs to Increase Efficiency

FpML has been a key enabler of automation in the derivatives industry, but its value could be further enhanced by providing value-added web services with open connectivity. These services will be equally important for the next generation of data and processing standards based on DLT and blockchain, write ISDA's Karel Engelen and TradeHeader's Marc Gratacos

The increased automation of over-the-counter (OTC) derivatives is built on the foundations of Financial products Markup Language (FpML)—an open-source standard for the electronic dealing and processing of derivatives. Rapid development and recent breakthroughs in distributed-ledger technology (DLT) and blockchain offer exciting possibilities to streamline post-trade processing, increase process automation and reduce reconciliations, all with the goal of increasing efficiency and reducing costs. The International Swaps and Derivatives Association's (ISDA) Common Domain Model provides the building blocks for the DLT environment.

Application programming interfaces (APIs) play an important role in this development. An API is a set of software requirements that define how a software application can interact with other software applications. It provides software developers with the information needed to program access to a specific application or web service.

Web services and their accessibility through open APIs provide extra customization and functionality that, if well designed, will enhance the existing infrastructure and can be easily leveraged in a DLT environment.

An example is version 1.0 of ISDA's open-source FpML to ISIN JavaScript Object Notation (JSON) Generator, released in September 2018. This tool addresses the data integration challenges posed by the introduction of International Securities Identification Number (ISIN) codes for OTC derivatives in the revised Markets in Financial Instruments Directive (Mifid II). In force since January 2018, Mifid II requires an ISIN—a unique 12-digit identifier code—for OTC products traded on European Union trading venues. The generator leverages FpML to assign a product taxonomy classification to an OTC trade and subsequently produce the input variables for the ISIN creation service to generate the code.

Blockchain tech could deliver big efficiency gains in post-trade processing

The generator takes FpML trades as an input, extracts values from the relevant FpML data fields and generates and validates the proprietary JSON format required by the Derivatives Service Bureau (DSB), the service that creates the ISINs. As such, the generator bridges the data disconnect between the format and representation used traditionally by firms and the DSB JSON format.

> By providing the services via an API, systems can connect and extract the information from the service in an automated fashion

Furthermore, the generator simplifies product classification. This would otherwise be challenging because the data required by the DSB varies by product type, and users need to classify the products before submitting the ISIN request. Producing the correct product classification from the ISDA OTC derivatives taxonomy requires firms to be able to identify a range of key data elements. The generator allows these data elements to be retrieved in a simple and effective way.

This example of the FpML to ISIN JSON web service and API underlines the potential for standards to move beyond mere publication on a static website. By providing the services via an API, systems can connect and extract the information from the service in an automated fashion. Systems connecting to the API can vary from internal applications to other web services, or applications running in a DLT environment, such as smart contracts.

In a DLT environment, the infrastructure is not closed and needs access to a variety of services, such as the generator, that provide a specific business function. The API then becomes another channel for publication and deployment, opening the way for the provision of value-added services and business models.

In the case of the FpML to ISIN JSON Generator, the service leverages the FpML standard. A similar approach can be taken to make the information published via the FpML standard itself more accessible. Looking ahead, this could include the reference data published by FpML, such as coding schemes and values, or the FpML business validation rules. Crucially, the speed and ease of implementation across the whole development process improves considerably, resulting in tangible cost savings. wt

Karel Engelen is senior director and co-head of data, reporting and FpML at ISDA. Marc Gratacos is founder and managing partner of TradeHeader.

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OPEN OUTCRY

What the key figures in fintech are saying this month

"When Euronext merged with NYSE, the focus on the European business became less important than it had been before. After it was bought by ICE, they decided to keep everything but Euronext. At this point, Euronext had to fight to remain independent and just survive."
Alain Courbebaisse, Euronext

» *see page 18 for full feature...*

"There are different types of trade finance transactions, many of them highly esoteric. This makes it incredibly hard to have detailed and comparable datasets. It's also very document heavy and requires a high level of specialization and lots of manual labor to parse those documents."
Andy Sweeney, Blackstar Capital

» *see page 76 for full feature...*

"To do this [implementing standards across all reported instruments in the future] industry-wide, it would cost billions of dollars to implement and I don't think I can see it happening."
Matt Hampson, Nomura

» *see page 94 for full feature...*

"Our discussions [about the CAT] have been deeper and we've seen a more experienced approach from Finra, including a very transparent, well-thought-out framing of the technical documents."
Judy McDonald, Susquehanna International Group

» *see page 8 for full feature...*

"Frankly right now, we'll take as many SSEOMS staff as we can."
Robert Mackay, Itiviti

» *see page 4 for full feature...*

"Alternative data was suffering from the same fragmentation that reference data used to suffer from. Integrating all these alternative data sources together so that clients can get them all from one vendor reduces complexity and cost."
Matthew Rawlings, Bloomberg

» *see page 80 for full feature...*

"One of the things machine learning is useful for is to allow an algorithm to infer what the shape of a relationship might be. Do we know that's a straight line relationship? Could it be curved? Could it depend on the environment we're in, or a particular time period, and so on?" **Seth Weingram, Acadian Asset Management**

» *see page 86 for full feature...*

"He says, 'This paper says 2% of our portfolio is exposed to conflict in Sudan—what the hell is that? What does that even mean? Where do you even get that?'" Moscardi recalls. What followed was a one-hour conversation in the hallway as to just what ESG risk exposure and materiality can mean in a market that's heating up—in more ways than one.
Matt Moscardi, MSCI

» *see page 14 for full feature...*

"Sometimes technical or data-driven analysis is part of the allocation strategy, but not the full optimization process. We need to remember that investment is not just a science, it is also an art." **Danny Wong, Areca Capital**

» *see page 90 for full feature...*

NEWSDESK

WatersTechnology's roundup of headlines that hit the wire this month from around the industry

USAM 'Slices' Alt Dataset of Sales Pipeline

Sales Slicer helps track sales activity

New York-based outsourced sales agency USAM Group has unveiled a suite of sales forecasting data and tools that track the progress of sales activity against benchmarks based on USAM's own sales efforts for clients, allowing sales organizations to optimize their efforts, and giving investors a realistic forecast of expected revenues for a company.

Dubbed Sales Slicer Benchmarks, the dataset collects granular information from vendors' sales organizations—so far, from USAM and its clients—and combines it into a benchmark for how long it should take to make a sale, how many times a salesperson should make contact with a potential client, and how many people they need to make contact with, among other factors.

Max Bowie

Pico Continues Infrastructure Upgrade

Faster paths equal lower latency

New York-based trading and low-latency infrastructure technology provider Pico Quantitative Trading says it is constantly reviewing its network latencies and migrating to faster paths when they become available.

"In addition, we review hardware with clients and upgrade either when better hardware is available or when the client's investment cycles are up," says Pico founder and CEO Jarrod Yuster. It also renews its own hardware at regular intervals and when lower latency hardware such as layer one (L1) switching enters the market. L1 is known as the physical layer and transmits data across physical mediums. In a conventional network switch, data messages received at L1 is passed up the chain to layer 2 or layer 3, where the decision is made on the content of the message. Then, the results are passed back to L1. This takes time, so availability of L1 switching would mean that the decision can actually be made at L1, and hence shorten latency.

Wei-Shen Wong

IHS Markit Debuts Client Onboarding Tool

New add-on cuts onboarding times

London-based data and technology provider IHS Markit has released its Onboarding Accelerator, aimed at slashing the average time required for the client onboarding process.

Onboarding Accelerator will be an add-on feature to its existing Counterparty Manager product, which serves as a document hub used by 12,000 buy-side customers and more than 150 brokers, dealers and other financial services providers to upload tax, credit, and know-your-customer documents. If there is a hang-up in the onboarding process, the tool will allow both parties to know immediately at which stage and which document or data point caused the error, as well as track where their documents are in the review process.

Rebecca Natale

OpenFin Raises $17m in Series C Funding

OpenFin has closed out its Series C round of funding, raising $17 million, which was led by Wells Fargo. The latest round brings the firm's overall venture funding to $40 million. In addition to Wells Fargo, Barclays participated in the round for the first time, as well as existing investors JP Morgan, Bain Capital Ventures and Pivot Investment Partners.

Rebecca Natale

ICE Launches Cloud-Based Tick History Tool

Intercontinental Exchange (ICE) has launched a cloud-based tick history platform called ICE DataVault. Rui Carvalho, head of product management for feeds at ICE Data Services, says the new platform offers a "cloud-based tick history service, global coverage and depth of history."

Zurich Insurance takes AIM at 'Data-as-a-Service'

Zurich Insurance is trying out a Data-as-a-Service model, in conjunction with AIM Software, in order to direct its energies toward high-level analytics and artificial intelligence. "We want to get into predictive analytics," says Ruchir Verma, head of global services in the investment management business at Zurich.

BrokerTec Debuts RFQ for European Repo

BrokerTec has launched BrokerTec Quote, a dealer-to-client request-for-quote (RFQ) product for the European repo market. BrokerTec's RFQ product will cover the trading of European sovereign bonds and UK gilts, with future updates likely to include US Treasuries and Australian and Japanese government bonds.

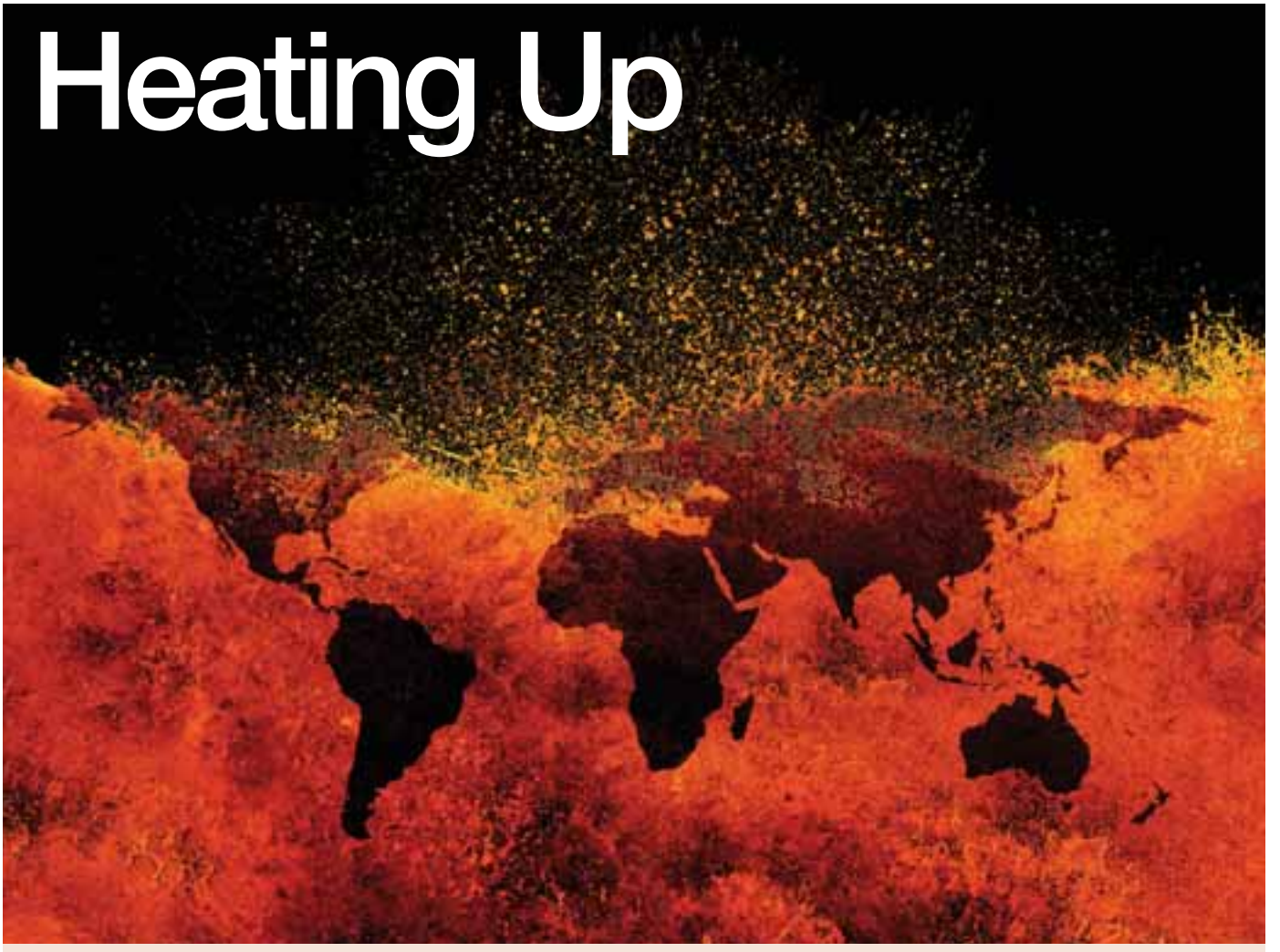
BNY Mellon to Use AI for Fast Document Queries

BNY Mellon is banking on artificial intelligence, particularly machine learning, to make access to—and understanding of—its documents easier for its employees. Chief digital officer Roman Regelman says the project will bring in documents, be it legal contracts or trading agreements, to make it easier for staff to query all internal records and find keywords quickly.

waterstechnology.com

For more information and readers' feedback please join the discussion

Heating Up



As the climate heats up, so too are requirements around carbon reporting. Unfortunately for investors who want to incorporate this form of ESG data into their investment portfolios, it's difficult to make like-for-like comparisons between companies, and materiality is—like efforts to reduce carbon emissions globally—a moving target, reports Rebecca Natale.

Six years ago, Matt Moscardi was in Europe, trying to win some new business for MSCI from an institutional asset manager. He was showing off the company's environmental, social and governance (ESG) information-ratings system, and to help with the presentation, he brought a carefully thought-out spiel and a tall stack of papers.

With a wry smile, Moscardi, executive director of ESG research at MSCI, admits that the stack was to show off "how incredibly smart" the company was. Unfortunately, the meeting wasn't exactly a rousing success—at least not at first. "They were kind of nonplussed; they just didn't care," he recalls.

He shook hands and thanked them for their time. Before leaving, he slid the pile of documents across the table. At the top of the stack was the firm's own portfolio, which Moscardi had already run through MSCI's analytics. He turned, walked out the door, headed halfway down the hallway, but before he could get to the elevator, a man from the meeting stopped him.

"He said, 'This paper says 2% of our portfolio is exposed to conflict in Sudan—what the hell is that? What does that even mean? Where do you even get that?'" Moscardi recalls.

What followed was a one-hour conversation in the hallway as to just what ESG risk exposure and materiality can mean in a market that's heating up—in more ways than one.

Despite being the talk of the town when it comes to ESG, carbon remains somewhat elusive to track and articulate. There's no shortage of carbon, or data on it, but how to put that data in context, how it ranks within wildly differing scores, and how to measure where it begins and ends with a particular company are murky at best.

Some investors say there's too much data. Others—or sometimes the same investors—want more data, and want it to be cleaner and more in-depth. The common thread between ESG issues and data is clear, but investors' aims might be better served by unbundling the large dataset, making them independent

of each other, and examining risk, not through a wide lens, but a high-powered microscope.

Waters Technology spoke with asset managers, vendors, and researchers about carbon data—what it consists of, how it's collected and contextualized, and whether or not investors can rely on it. The consensus is that firms need to look at these metrics with a skeptical eye. But if these kinks can get ironed out, as regulators and governments take a closer look at carbon, the data surrounding this space will only become increasingly valuable.

> "The definition of materiality is actually a negative. If you look up the regulatory definition of what is material, it varies by jurisdiction, but it largely relies on a variation of this: If information you didn't know would have changed your decision, it's effectively material. And in that case, it could be anything."
> **Matt Moscardi, MSCI**

Materiality

ESG performance is governed by what's known as materiality, or relevance, of issues that are specific to returns, stakeholders, and company operations. For each of the many metrics that fall under the large ESG umbrella—say, for board diversity or child labor policies—firms make decisions as to how important these numbers are when it comes to a company outperforming revenue expectations. For many of these subsets, there's plenty of measurable, consistent data available. Carbon is trickier. For issues under the "E" silo of ESG, it's easier to measure physical climate risks like land and water usage, or whether a facility will succumb to sea-level rise. Like smoke, carbon leaves damage behind long after the fire's out, and has a far-reaching effect, making defining materiality around carbon difficult.

Moscardi, whose company receives requests for even esoteric data points such as the sizes of drift nets used by commercial fishing boats, has learned that materiality isn't one size fits all. "The definition of materiality is actually a negative," he says. "If you look up the regulatory definition of what is material, it varies by jurisdiction, but it largely relies on a variation of this: If information you didn't know would have changed your decision, it's effectively material. And in that case, it could be anything."

For carbon to be a dataset upon which investors can make well-informed investment decisions, find alpha and mitigate risk, it has to become more digestible, transparent and consistent, and that starts with what companies report.

Matt Moscardi
MSCI

Arabesque Asset Management, born out of Barclays in Europe in 2011, assesses the performance and sustainability of more than 7,000 companies in the investment universe in real-time. It is developing a new scoring tool that is aimed at sifting through the carbon mess. It will rate how companies are reporting their carbon emissions and their contributions to global warming, says Rebecca Thomas, an ESG research associate at the asset manager who is working on the project. The tool is part of Arabesque's effort to line companies up behind a single, widely followed regulation—the Greenhouse Gas Protocol—to help users put carbon into context.

"It might not be the perfect regulation, but at least following one that's generally accepted could really help with understanding comparability between companies and between actions, as well," Thomas says.

The big question in determining what's material to companies, she says, will be answered by digging into what's known as carbon scope three.

A Bad Kind of Wash

When a company reports its carbon footprint, much of that data relies on carbon scopes one and two. These two measurements include onsite emissions from facilities owned or controlled by the company, as well as emissions from purchased energy. A third measurement, carbon scope three, encompasses the entire value chain of a company's resources and products down the line until they decompose and become atmospheric gas. Roughly, scope three is equal to about three times the impact of the former two, according to Kellen Parker, vice president of analytics at Flat World Partners, an investment advisory firm focused on impact investments. It's also the least reported.

It's hard to measure, and both the tools and data needed to paint the full picture don't exist yet. However, Parker says, companies know this and use the data gap to their advantage.

"When a company says they're cleaner, a lot of the time it's because they've outsourced some of their activities to suppliers and contractors," he says. "They

AI to the Rescue

To make difficult assessments of ESG factors, vendors and trading houses tend to rely on more than just numbers in spreadsheets. Increasingly, companies are turning to artificial intelligence (AI) and machine learning to help find materiality and to make comparisons that are more apples-to-apples.

For its offering, TruValue Labs, a specialist vendor of ESG scores that covers about 15,000 equities and 1,000 private companies, marries together two of the "megatrends": modern computing technology, such as AI, machine learning and deep learning, overlaid with big unstructured datasets, says Hendrik Bartel, the company's CEO.

When TruValue came onto the scene six years ago, Bartel says he saw an ocean of ratings that were all subjective and non-correlated, which isn't exactly different from today. "When you compare all of the major ESG ratings agencies and look at the ratings for the S&P 500, what you will see is that there's less than 10% correlation between scores," he says.

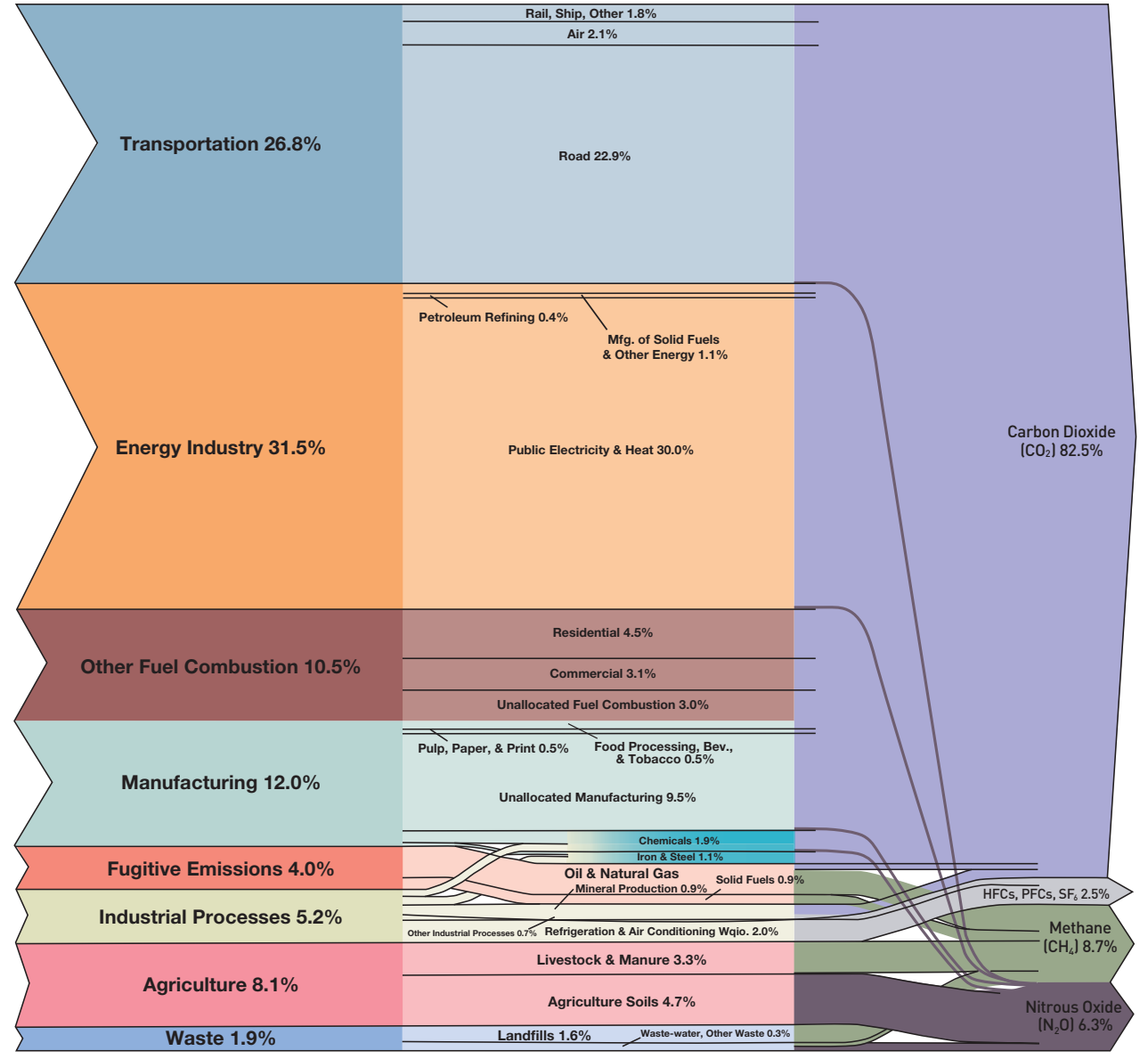
TruValue drew the line at ingesting any data that came from companies themselves or public relation teams, including corporate social responsibility (CSR) reports. Instead, their method combines nonprofit organization sources, analyst reports, local and global news, and "thought leader data" from a network of scholars who publish blogs and journals on specific sectors.

All this information then gets pulled in by using web-scraping techniques and algorithms that recognize patterns in the data. For example, it picks out the rule of law and seeks out news stories around case rulings for or against companies and industries. In turn, four different scores are generated that measure how companies are performing in the market in real-time and historically.

"It allows us to keep in deep memory, if you will, massive events that a company has gone through like VW, Facebook, Equifax or the BPs of the world," Bartel says. "The data never forgets."

Bartel says collecting carbon data, though, is interesting in itself because it relies heavily on extrapolation based on a lot of guesses about what carbon outputs might be. Just like the broader world of ESG, there's no real standard behind how to account for carbon.

"It's an assumed dataset, but we don't assume anything," Bartel says. "We don't report a carbon footprint or anything like that. We create the case around it: why a company could have a footprint of X or Y, and we look at their behavior over the past week, month, quarter, year or 10 years."



Source: U.S. EPA (2013) Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2012. CRF Tables

typically only control—or only buy off—for scopes one and two, and not for their entire chain. They can justify it by saying they've pressured their suppliers to adopt similar targets, but rarely is it a make-or-break thing."

Parker estimates about half of the companies listed in the S&P 500 report on scopes one and two, and that number drops to about 40% when it comes to scope three. The intention might not be to deceive, but the missing data does create another ironic risk for investors hoping to reap long-term returns by investing in companies that seem low-carbon, and therefore, low-risk.

It's a hard question, Parker says, to answer how one comes up with better indicators and how to add context in terms of risk versus impact.

"We've been cautious with how much weight we want to give [the supply-chain side of the equation] given the uncertainties there," he says. "We started with showing the issues inherent in the industry. If you're invested in a commodity, and if we have some location data, we'll map that to show where we think factories are located to show relevant risk."

A Heavy Hand

One of the pervasive problems with ESG is the lack of standardization around the data, made more complicated by varying degrees of regulation from country to

country. When it comes to reporting, Nordic firms have relatively stringent requirements. Well over a decade ago, the mostly self-regulated Norwegian Government Pension Fund initiated a now-standard approach of negative screening, or blacklisting companies based on ethical guidelines. Earlier this year, the Swedish Investment Fund Association enacted a sustainability information standard, applying to all securities funds that operate within the country.

In Japan, like the Nordics, regulation is mostly derived from investor expectations instead of governmental action. As a result, the Government Pension Investment Fund (GPIF), the largest pension fund in the world, picked the S&P Dow Jones Carbon Efficient Index as its ESG benchmark this past September. Per the Paris Agreement, the nation pledged a 26% reduction in emissions by 2030, compared to 2013, its peak year for emissions following the Fukushima nuclear disaster.

In March, the EU, which has pledged at least a 40% reduction in 1990-level emissions by 2030, adopted a disclosure regulation into the European Commission's sustainable finance plan, aimed at limiting "greenwashing," or misleading on environmental friendliness. The mandate adhered to sustainable development goals (SDGs) and the Paris Agreement, and served as the first regulator-backed sustainable investment framework in the region.

The US, however, stands in contrast, as it pulled out of the Paris Agreement in 2017, and the Department of Labor earlier this year issued a warning to financial managers that ESG investments aren't always "prudent." With the US pumping the brakes on federally mandated carbon-focused requirements, it could make it even more difficult to compare companies.

Global approaches to ESG—and, specifically, to addressing climate change—are fragmented. Still, ESG investing is still relatively young—it wasn't until the late 1960s and early 1970s that it started to gain any real traction—so it lacks the longevity other investment strategies do. Arabesque's Thomas says clarity can come from combined efforts from regulators, local governments, investors and businesses, combined with better artificial intelligence integration. Regulators might consider ensuring companies adhere to a single standard, while machine learning can help investors understand which components of carbon emissions are material across industries.

"I find it a fallacy that such diverse topics all the way from data privacy issues to child labor issues get bundled up in those three letters, so we've unbundled all of ESG."
Hendrik Bartel, TruValue

"When we know more about what aspects are material, we can drive the regulation toward making that more standardized so that when we're comparing emissions for a particular activity, we're comparing the same things across different companies," Thomas says.

Forward Thinking

A catch-all solution, in pursuit of the level of granularity and context that investors want, might lie in a total overhaul of the way carbon is presented. This would entail making three independent datasets—with E, S, and G unbundled, with different sets of standards and methods around each one. The paradox here is that while there's already so much data, it's also not enough, and some vendors have already begun to unbundle the silos.

"I find it a fallacy that such diverse topics all the way from data privacy issues to child labor issues get bundled up in those three letters, so we've unbundled all of ESG," says TruValue's Bartel, adding that apart from building hundreds of risk signals, the company's base materiality framework is malleable. Though it rests on the US-based Sustainability Accounting Standards Board (SASB) or SDGs, it can be reconstituted to fit managers' own viewpoints of materiality or their own ESG theories.

Hendrik Bartel
TruValue

Similarly, on the management side, some have started to diverge from relying on mainstream ESG rankings and are separating the themes. Flat World's Parker cites Facebook as a hard pill to swallow. "Facebook has been massively profitable; they have very good governance on that side, but they're very bad as a global citizen," Parker says. "It's hard. The overlap in skillsets between finance and sustainability is low. It's a bunch of different people with a bunch of different priorities, and it's kind of a fruitcake that gets baked together and is hard for people to parse out."

Carbon's reach, like lion king Simba's kingdom, extends to everything the light touches. Every company and industry consumes energy, and as governments at every level rally around the idea of a 2°C Scenario—the goal for a maximum temperature increase of 2 degrees Celsius before pre-industrial levels—investors have to, as the saying goes, know what they own before it's too late. wt

The last decade has seen Euronext chewed up and spun out following a series of mergers and acquisitions. Once again independent, CIO Alain Courbebaisse is writing the exchange's IT roadmap. By Josephine Gallagher

Running any business

can feel like a life-or-death struggle, but Alain Courbebaisse knows what life-or-death really means.

One of Courbebaisse's first tech jobs was heading up a team that developed life-saving medical technologies. He had no experience in finance—nor any interest in it—when he joined a French brokerage in 1999. Working in the financial services industry might seem a little tame compared to saving lives, but Courbebaisse happened to launch his career in finance just as unprecedented changes began to envelop financial technology.

Today—now a veteran of the capital markets—Courbebaisse must guide Euronext through a period of substantial transformation as the exchange unwinds legacy systems stemming from its marriage with the New York Stock Exchange (NYSE), which was dissolved three years earlier.

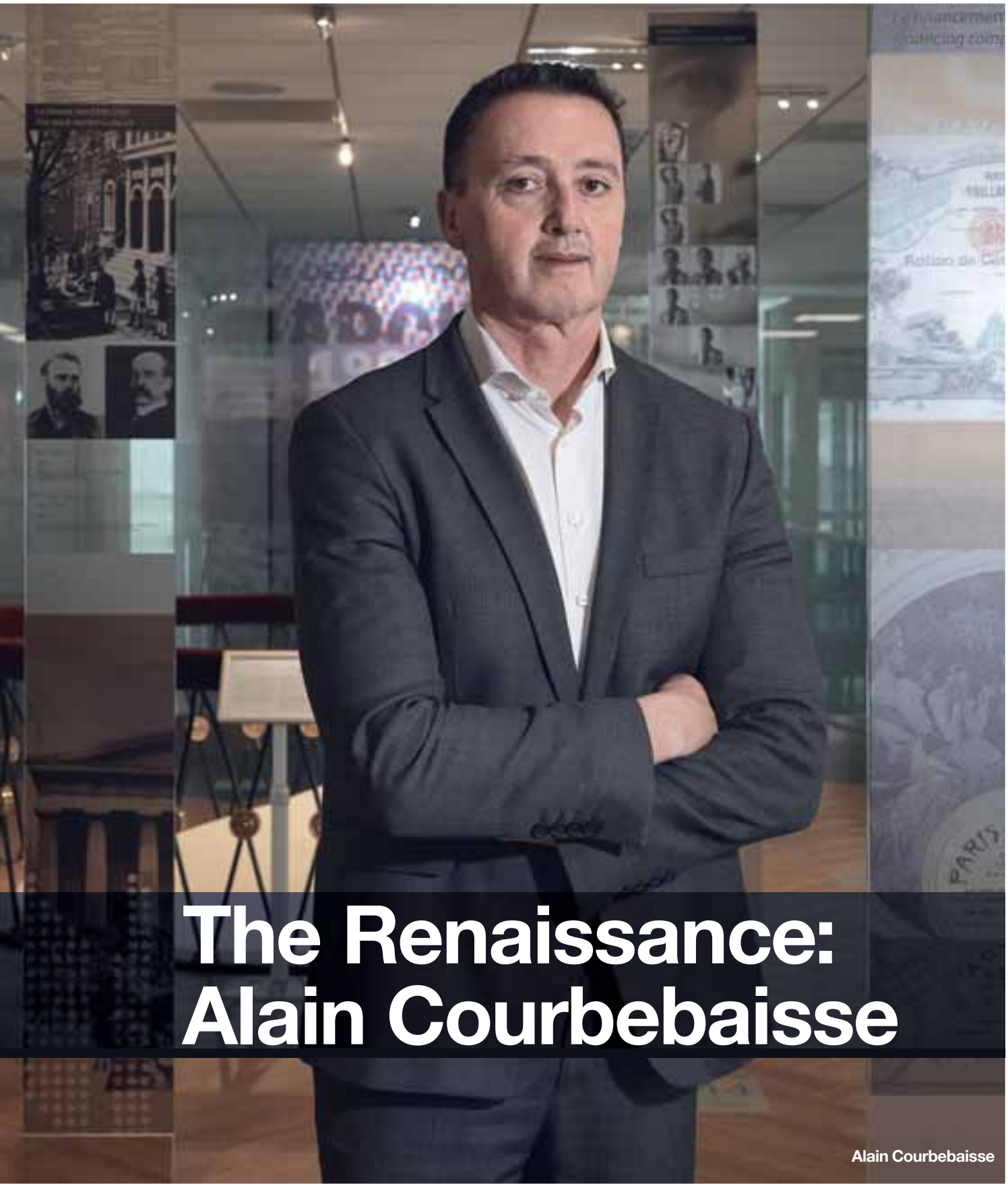
It's now a well-known story: In 2006, NYSE agreed to buy Euronext, besting a counteroffer by Deutsche Börse. The new entity, NYSE Euronext, would itself get swallowed up, with the Intercontinental Exchange (ICE) Group acquiring the pan-Atlantic exchange in 2013. ICE's management did not feel it was equipped to run the European arm of NYSE Euronext, so ICE divested Euronext, thus setting it free once more.

Even today, however, the exchange continues to battle for operational independence.

"When Euronext merged with NYSE, the focus on the European business became less important than it had been before. After it was bought by ICE, they decided to keep everything but Euronext. At this point, Euronext had to fight to remain independent and just survive," says Courbebaisse.

Short-term survival seems assured now, and autonomy has become Euronext's core focus. The company can finally grow into an independent entity and migrate its operations to Optiq, its proprietary trading platform.

Courbebaisse is leading this migration. But since his appointment, he has realized that the last few years of turmoil have unsettled Euronext's tech staff, which comprises about 25% of the exchange's total workforce. Improving morale has become a major priority for him, especially as these teams would go on to form the backbone of the company in its new era.



The Renaissance: Alain Courbebaisse

Alain Courbebaisse

"There was a lack of self-belief at the time [of the spin-off]. When you don't believe that you can achieve something, it always makes your job harder," he says.

Coding to Save Lives

From the early days of his career, Courbebaisse has played a role in building out critical systems. His first few technology jobs, however, had little to do with the low-latency trading platforms of today.

In 1997, Courbebaisse became head of IT for Draeger Medical, a German healthcare firm. At Draeger, he managed a team of three and they were responsible for coding algorithms for life-saving technologies, including breathing apparatuses and anesthesia workstations. He recalls the time as an exciting point in his career, when he learned the significance of a meaningfully critical system.

> "When it comes to coding a life-critical application, there is no margin for error. Dealing with such an environment, I quickly discovered the difference between what is and what isn't a critical system."

"When it comes to coding a life-critical application, there is no margin for error. Dealing with such an environment, I quickly discovered the difference between what is and what isn't a critical system," says Courbebaisse.

In his two years at the healthcare firm, Courbebaisse helped to build a front-to-back, remote connectivity service for the firm, where out of about 200 staff, 150 worked remotely. He describes the project as fun; the team had to carefully write each piece of code and synchronize every individual remote personal computer to the central server. Courbebaisse also deployed Draeger's very first customer relationship management (CRM) system.

But for Courbebaisse, his experience at Draeger Medical was pivotal not only for the technical projects he worked on, but because of the people he had met. Draeger's CEO at that time was Alain Rastouil. Courbebaisse says Ratouil has inspired him more than anyone else throughout his career, and opened his

eyes to a world of opportunities that he had access to, yet never realized existed.

"He gave me a lot of confidence in myself," says Courbebaisse. "It was as if he unleashed my potential, or at least the perception of my potential. Especially when you come from a modest kind of background, you have no idea what's possible. You don't even compete, and you never imagine that you could get to this level."

Courbebaisse has embedded these teachings into his own style of management. He sees it as his mission to nurture teams and establish confidence in their abilities. From his perspective, technology talent is a firm's most important asset, and a core focus for him as CIO and head of technology at Euronext is to develop an attractive environment for people to grow, have fun and envisage a future.

The Rebuild

When Courbebaisse was appointed CIO of Euronext in 2017, he perceived that the wounds inflicted by Euronext's spin-off from NYSE went deeper than its technical infrastructure. Morale was low as staff were uncertain about the future.

To lift spirits, Courbebaisse is pushing for open dialogue between all levels of tech employees, acquiring diverse talent to challenge traditional work practices and create a process for rewarding hard work.

Courbebaisse and his team are responsible for implementing Euronext's three-year Agility for Growth Strategy, which intends to diversify revenue streams, strengthen business lines and move into new geographies. Euronext currently operates exchanges in Paris, Brussels, Amsterdam, Lisbon and now Dublin, after acquiring the Irish Stock Exchange in March 2018. Seven months earlier, Euronext purchased FastMatch, a foreign exchange (FX) trading platform, now called Euronext FX.

This momentum slowed earlier this year when Nasdaq blocked Euronext's attempt to take over 100% of the Oslo Børs, starting a bidding war. However, on May 14, Norway's Finance Ministry approved Euronext's bid to complete the $790 million takeover.

"At the moment, we are looking at what could be a game-changer for us," says Courbebaisse. "We want to diversify our revenue streams and business services. We want to be less dependent on volume-related revenues and look

at the post-trade environment and at other asset classes, as well as to be more commercially creative on the data side."

As part of the strategic plan, Courbebaisse also heads up the delivery of Euronext's wide-scale migration project to the Optiq trading platform. So far, the exchange has completed the move of its market data and cash markets for phase one and two of the rollout, and plans to finalize phase three—the migration of its derivatives markets—on November 25, 2019. But like most multi-year projects with multiple moving parts, time management and meeting deadlines for complex initiatives have proven to be challenging.

Courbebaisse says that, for Euronext, the difficulty lies in balancing the timelines for the Optiq platform, as it will act as the foundational layer of Euronext's trading operations. The point is to ensure accurate completion of the underlying technology and each link in the chain, to avoid freezing the development of later project cycles.

"Managing time well, knowing when to apply change and when to prioritize what, can be one of the hardest things to do," he says. "As the IT implementation of our Agility for Growth Strategy was the main focus for many years, there is a backlog of other initiatives that we now need to find time for."

Timeline

- **1986** – Fimat was founded as a prime brokerage subsidiary of Societe Generale.
- **2008** – Fimat merged with Calyon Financial, a subsidiary of Crédit Agricole's investment bank to create a joint prime brokerage business under a new title, Newedge.
- **2014** – Societe Generale acquired a 100% stake in Newedge from Crédit Agricole.

The Electronic Age

The road that led Courbebaisse to Euronext was a winding one, and he has seen his fair share of change and acquisitions.

In his Draeger days, Courbebaisse was never attracted to the financial world. But in 1999, French brokerage Fimat headhunted him. Courbebaisse knew nothing about trading when he was offered the job as head of IT at Fimat France, and barely understood how the financial space operated. He took the opportunity because he was a young dad, eager to progress in his career and on the lookout for a new challenge.

As it turned out, he could not have joined the industry at a better time. It was the advent of electronic trading and it didn't matter if he had no experience, as even veterans of the trading floor were adapting to the new wave of automation, computing power and communication networks.

At Fimat, Courbebaisse got his first taste of trading technology—and he was hooked. He loved coming to grips with the technology and developing streamlined systems that could move money around the world. The excitement of building complex trading platforms at such a watershed moment for the markets set him on-route for a career in finance.

"I spent a lot of time on the desk with the traders, helping them to do their job. Their job was new at the time and most of them had been inside the pit shouting just one or two years prior. It was good timing [to join] and I think not knowing everything can sometimes allow you to have a more open mind," he says.

Still, his career has not been without disappointments. In 2002, Courbebaisse was CIO of Fimat France and global head of development for the brokerage. At the time, the France offices were raking in profits and smashing performance targets, thanks in part to the platforms and processes he had helped to develop.

He believed that a promotion would be a "slam dunk." So when the group announced it was seeking a global CIO, Courbebaisse was convinced the position was his—even calling his mother to explain that he would have to relocate from Paris to the firm's New York offices.

But Courbebaisse, for once, had overshot. He was not even interviewed for the position. The lesson in humility was a valuable one, he says, though it was a tough pill to swallow.

"It took a bit of time for me to get over. Once I had moved past the sense of humiliation, I met the new guy. Technically and on team management, he didn't have much to learn from me. But he taught me how to truly manage the entire ecosystem," says Courbebaisse.

That "new guy" was Richard Wilson, and Courbebaisse and Wilson became great friends. When Wilson was later promoted once again, this time there was no doubt who would take his place—in 2009, Courbebaisse was named global CIO.

In his 16 years at Fimat and the various iterations that would eventually lead to Newedge (*see Timeline*), he saw at close range the markets change dramatically and irrevocably with the rise of the electronic age, the emergence of high-speed trading, the global financial crisis, and the ensuing onslaught of regulation.

These experiences would help to inform his ideas about how to best run Euronext's technology team.

On the Defensive

One of Courbebaisse's major challenges will be fixing Euronext's IT culture. In order to make progress, he says, cultural mindsets must evolve to be more process-oriented. Removing legacy systems is not enough to remain competitive; workflows and processes also need to adapt. Exchanges have to future-proof their business lines to withstand the threats inherent in an increasingly competitive marketplace, and the heated debate about inflated exchange fees.

This is especially crucial as the exchange oligopolies of 20 years ago become a thing of the past. Today, exchanges are heavily criticized for price escalations and face fierce competition from alternative trading venues like systematic internalizers and multilateral trading facilities, dark pools and frequent batch auctions.

Even more worrying for the incumbent bourses was the announcement of the Members Exchange early this year: A group of nine major financial institutions joined forces in a bid to challenge heavyweight incumbents like Nasdaq; Cboe Global Markets; and Euronext's old partner, NYSE.

Courbebaisse accepts that exchanges are having to adapt to this new level of competition. He says Euronext's response to these growing threats will be to diversify business activities, enhance its data analytics and embrace new technologies, particularly the cloud.

"The next phase will be to deploy Optiq from the cloud with a whole set of analytics and data available in a matter of two clicks. We have everything, including the infrastructure, coded in a template and the function can be deployed in two seconds. Moving away from a static on-premise technology will make us far more agile and help us to move into something that is almost independent of the underlying infrastructure," he says, noting that this plan will go into full effect after the final phase of the Optiq migration.

Another key differentiator will be the firm's value-added analytics and alternative data offerings, such as environmental, social, and governance (ESG) data.

Euronext also wants to strengthen its engagement with other fintech companies and start-ups, in part to attract valuable tech talent. Courbebaisse says a shortage of skills is one of the most pressing issues impacting the industry. His hope is that working with fintech firms and start-ups on innovative projects in the future can be an effective way of making larger financial market firms more appealing to a diverse pool of candidates.

More than anything, Courbebaisse says he believes moving forward is the only way to survive in a disruptive market. Consistently reviewing, testing and auditing new technologies, quality checking processes and consistently seeking improvements are key pillars of the bourse's plan to stay ahead.

"At Euronext, there is a cultural shift taking place—the strive for 'continuous improvement.' It means never taking your eye off the ball or resting on your laurels—you know it won't last," Courbebaisse says.

If it succeeds, it will be Euronext continuing to gobble up other exchanges and charting its own course—or else it will be a case of history repeating itself. wt

A Look at SFTR

While the initial go-live date of SFTR is set for early 2020, data availability and legacy processes remain the leading roadblocks.
By Josephine Gallagher

The need to obtain necessary data points and automate workflows is causing considerable challenges for the industry ahead of the phase-in of the Securities Financing Transactions Regulation (SFTR), which is set to begin in the second quarter of 2020.

The complex regulation mandates a dual-sided reporting structure, where each counterparty firm is required to report the "conclusion, modification and termination" of an entire event lifecycle on a T+1 basis to a trade repository (TR). It targets multiple divisions, including repurchase agreements (repos), buy/sell-backs, securities lending, margin lending, and stock and commodities loans. As each counterparty firm involved in an SFT trade or in the reuse of collateral is required to report, capturing the data necessary to fulfill the compliance obligations is becoming an incessant problem, particularly as the deadline closes in.

Speaking at an SFTR panel discussion at the SimCorp Regional Summit in London on May 14, Hussain Abdullah, a senior manager on Deloitte's risk advisory team, explained that many of the problems center around the primitive systems and legacy processes that still exist in SFT trading. He highlighted that the SFT world has fallen behind compared to other parts of the industry when it comes to embracing technologies and automating practices.

"So all the other areas have moved forward because of Mifid II and because of regulation in that space, but what you see when you look at an SFT ecosystem—arguably this is not the same with all firms—is that there is generally a line between the integrity and efficiency of processes, because the SFT ecosystem is not as mature as these other areas," he explained.

Repo Risk

SFTs have been largely unaffected by regulatory requirements until now, meaning some of the industry has been slow to embrace technological advancements such as automation or digital trading practices. Pierre Khemdoudi, managing director and global co-head of equities, data, and analytics at IHS Markit, tells *WatersTechnology* that "the industry has been carrying a technology debt," particularly across the repos market.

"We're talking about hundreds of millions of events going through trade repositories, sometimes in real time, being enriched across multiple assets," he says. "So it's fairly complex when you look at the outputs of the regulation and what it requires. When you look at the technology stack, to what would be a regulatory engine, it is fairly disparate, primitive and not standardized."

In a survey published in March 2018, the International Capital Market Association (Icma) estimated that by the end of 2017, the European repo market was valued at nearly €7.25 billion ($8.45 billion). Today, a large portion of that repo market still operates on legacy systems and relies on manual processes to execute trades. Millions of transactions are carried out using basic technology and old-school practices such as emails, phone calls, faxes, and spreadsheets.

"There is a senior employee working at a bank and active broker-dealer working in repo who told me that they have two people working eight hours a day each, just to re-key repo trades," says Glenn Havlicek, CEO and co-founder of repo-trading platform GLMX. "That takes a lot of time, effort and cost."

Even today, a large portion of the repo market still suffers from manually led processes and outdated systems. Millions of transactions are still carried out using basic technologies and practices such as emails, phone calls, faxes, and spreadsheets. The challenge is that counterparty firms will have to capture large volumes of data from multiple parties (counterparty firms, agent lenders/dealers, central securities depositories, etc.) across a complex chain of events and allocate the reports into 153 fields across four different categories—margin data, transaction data, re-use data, and counterparty data. It is a colossal task by any measure and according to some, may discourage firms from trading SFTs at all.

"I think that is one of the strategies that some of the smaller players are looking at, [in terms of] what they have done before, in a rather manual way and if they would like to continue given the return they generate in SFTs," explained Carsten Kunkel, head of SimCorp's regulatory center of excellence, during the panel discussion.

The Agent Lender

Adding to the complexity is the role of the agent lender. These specialists operate on behalf of the beneficiary firm in allocating trades and bridging communications between the borrowers and other counterparties. As the middleman in SFT process, their position allows them control over most of the transactional and collateral data in the trade lifecycle. Some say the agent lender is naturally in a position to facilitate market transparency under the regulation, rather than solely helping counterparty firms to fulfill their SFTR obligations.

"What's ironic about this regulation is that the firms with the most data and the most visibility in this industry are the agent lenders, and they don't have a regulatory obligation," said Mark Steadman, executive director of product development and change management at DTCC.

In many cases, the beneficiary firms can also delegate reporting obligations to the agent lender or a tri-party agent. Speaking on the sidelines of the summit, Steadman further explained that although an agent lender holds all the data necessary to report on its beneficiary's behalf, there is a remaining operational challenge to overcome. As agent lenders have never had to report before, the entities largely remain siloed from other divisions such as the investment bank or regulatory departments.

A Cautionary Tale of Delegated Reporting

Another concern that has warranted attention from industry experts is the number of delegated relationships counterparty firms onboard. Deloitte's Abdullah cautioned firms about over-complicating the compliance process by delegating their reporting requirements to multiple agent lenders, as in each case, the individual agent lender will only handle the trades they are delegated.

"So if you have three agent lenders, you have three delegated reporting arrangements, three sets of data, three sets of oversight processes and three sets of reconciliations just there and then. So you have to be careful about how you run the delegated arrangement and how they are set up. You can't delegate responsibility—that is still with you," the counterpart, he explained.

The idea is that firms delegating their reporting to an agent lender or tri-party firm will need to have the necessary support systems to monitor the reporting activity and ensure it is done in an accurate and timely manner. Similarly, when outsourcing to a third-party vendor, counterparty firms must approach their requirements with the same due diligence as they would if using in-house reporting systems.

"If you ask the question, 'What are the pros and cons of delegated reporting?', I would say the pro is that someone else is reporting on your behalf, and the con is that someone else is reporting on your behalf. It's as technical as that—delegated reporting means your control framework is likely to be more complicated and as a trade repository, we are seeing the regulators come to us for access to our data as well as data from the buy-side," said Steadman. wt

SFTR Go-Live Timeline

- **Q2 2020** – Credit institutions and investment firms
- **Q3 2020** – Central counterparties (CCPs) and central securities depositories (CSDs)
- **Q4 2020** – Pension funds and UCITS
- **Q1 2021** – Non-financial counterparties

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Curiosity—A Winning Trait

Curiosity may have killed the cat, but in business it's a characteristic that can grant you nine lives.

In fact, it's a key ingredient to many of the winning recipes that grace the *Inside Market Data & Inside Reference Data Awards* each year. If not for curious minds asking "How could this be done better?" or "Why does the industry do things that way?", development of new products and services would stagnate. If people weren't constantly seeking better ways of doing things, what impetus would there be to drive the industry forward?

If latency-sensitive traders hadn't wondered whether there were better routes and, ultimately, whether wireless could support data and trading traffic, would we still have the same exciting developments around low-latency data transmission that won Pico Quantitative Trading the Best Low-Latency Data/Technology Provider award? Or if researchers hadn't wondered whether datasets outside the financial realm could be indicators of stock price movements, would Quandl (winner, Best Alternative Data Provider), FactSet (winner, Best Alternative Data Initiative) and others be blazing trails in the alternative data field?

And, if he hadn't wondered whether there was a better way to collect and analyze information about who was using what products, and how competitors ranked against each other for product development purposes at Thomson Financial, this year's Hall of Fame inductee, Douglas Taylor, might never have set up Burton-Taylor International Consulting and authored a range of market share and industry spend reports.

Without curiosity, this otherwise vibrant, competitive and innovative industry would be a lot more boring, and there'd be far fewer winners.

Stay curious, my friends.

Max Bowie, Editor-at-Large
WatersTechnology

The Winners

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Overall Best Data Provider **S&P Global Market Intelligence** Page 31

Best AI/Machine Learning Data Initiative **Truvalue Labs** Page 32

Best Big Data Analytics & Technology Provider **McObject** Page 33

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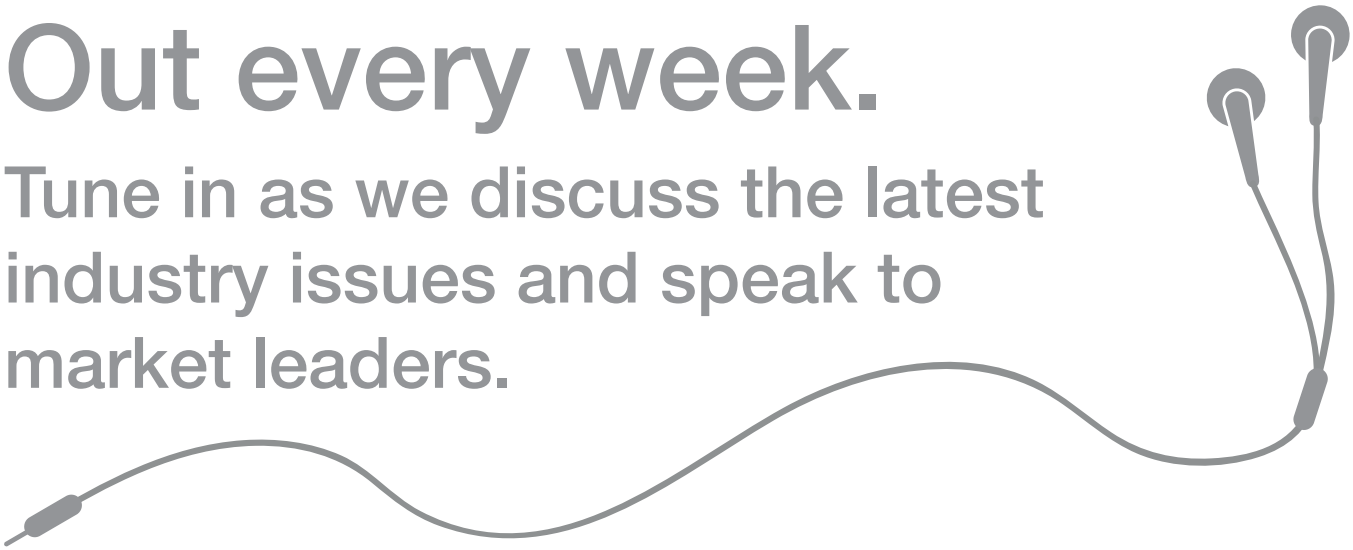

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Inside Market Data Hall of Fame

Douglas Taylor, "The Surveyor"

Before starting Burton-Taylor International Consulting and authoring definitive reports on market size and competitive share for the market data industry, Douglas Taylor had already spent a quarter of a century in the financial and market data industries. Now, more than a dozen years later, he's preparing to hand the reins of the business to his successor—but has no desire to retire.

Data wasn't always Tulsa, Oklahoma-raised Taylor's passion. In fact, a young Taylor initially saw his future in basketball but, in his sophomore year, broke his hand during practice. The injury kept him off the court for much of the year, and though he returned the next year he ended up quitting the team.

Taylor completed a degree in finance and spent a couple of years working as a DJ before joining Merrill Lynch as a retail broker. He loved the job, but craved something different after three years, so undertook a Master of Business Administration degree and then a job at Reuters in Houston.

The result was a career that leaves Taylor nostalgic: "I always say my worst day at Reuters was a great day. I ended up in multiple jobs—every couple of years I wanted a new challenge. It was fantastic to be working at a company that, if you had brains and didn't make the same mistakes, would give you opportunities to move around," from sales to marketing and management, he says.

During that time, Taylor worked across several locations in the US and in London. However, his real ambition was to work in Asia, although there were no vacancies, so he left Reuters and was working at Microsoft when he received a surprise call from a former Reuters colleague who was now at Thomson Financial—which needed a head of product and marketing in Hong Kong. The role would sow the seeds of what would ultimately become Burton-Taylor.

Thomson had ambitions to triple its business in Asia from $70 million to $200 million in five years. "To deliver on that strategy, I needed … to understand how big the market data space was, our competitors—and whether they were doing a good or bad job—and the needs of all customers," he says. Taylor hired research firms for answers, but wasn't satisfied with the results, so oversaw 1,500 30-minute interviews, then broke down the results by country, competitor, user type and data type, making heat maps of what each user needed in each country and how they rated each competitor.

The result was half-inch-thick blue books that became the bible of sales strategy in the region. "Management loved them, and we got the investment to build products that would get us to $200 million," he says. But the jubilation was short-lived: new management replaced Taylor's boss, and Taylor followed shortly after.

"I'm sitting there in Hong Kong, thinking about how I'm going to support my wife and daughter, and I thought, all that work I did on the survey—there must be plenty of businesspeople looking for information on where to invest to get a better return for their company. And so, in 2006, I started Burton-Taylor International Consulting."

Max Bowie (L) and Douglas Taylor

The first report was a lenticular-printed postcard that showed the before and after market share impact of the 2007 Thomson Corporation–Reuters merger. Over the following decade, Taylor expanded the range and scope of reports covered, recruiting Chris Porter—who had managed the relationship with Burton-Taylor while at Dow Jones, the firm's first US client—to produce media intelligence reports. In 2010, Taylor published a report on China that attracted the attention of former Reuters colleague Brian De Lacy—then CEO of Internet Securities, and its Emerging Markets Information Service (EMIS) and Chinese Economic Information Company businesses. De Lacy didn't just want the research—he wanted Taylor on-staff to define the vendor's product strategy, so Taylor seconded himself to EMIS for five years to rebuild EMIS' product and marketing team, and conduct an extensive interview process to revamp the EMIS product.

When he wrapped up his work with EMIS, Taylor found himself in demand in a different way: he had been approached before about selling Burton-Taylor, but when he mentioned this to former Reuters colleague Frank Desmond—then head of Tullett Prebon Information—Desmond jumped at the chance to establish a proprietary subscription-based research business that could go from two people producing a handful of reports a year to five people producing upwards of 30 per year on different topics fueled by TP ICAP data.

One of those is former Tabb Group head of research and consulting Andy Nybo, who will take over from Taylor when his contract to remain with Burton-Taylor post-acquisition expires at the end of this year.

However, Taylor is not done with data—though he doesn't yet know his next steps. "I'm not going to disappear. I've got too much energy and love this industry too much," he says. "The market data space is getting more exciting—for example, with alternative data. It's a great time to be in market data." wt

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Overall Best Data Provider

S&P Global Market Intelligence

S&P Global Market Intelligence—by virtue of its wins in the Risk Data Aggregation Provider and Reference Data Initiative categories and strong showings in the Counterparty Data Provider, Alternative Data Provider and AI/Machine Learning Data Initiative categories—bags the prestigious Overall Best Data Provider award for 2019.

"We chose S&P Global Market Intelligence as this year's Best Overall Data Provider not just on the basis of the strength of its winning entries but also on the strength of its entries in other categories that showcased the vast depth and breadth of its data offerings and technical capabilities, and made the company stand above its competition," said Max Bowie, editor-at-large, *WatersTechnology*.

It is fair to say S&P Global Market Intelligence has had a busy year, making significant investments in its expansive suite of content and solutions, and adding datasets and new capabilities from some notable acquisitions. For example, last year, parent company S&P Global completed its acquisition of Panjiva, a provider of data science-based sector-relevant insights on global supply chains, covering more than 40% of the world's trade.

"We are now delivering Panjiva Supply Chain Intelligence via Xpressfeed, our datafeed management system, utilizing our cross-reference services capabilities, and we have made a further investment to continue to enhance and expand the coverage," says Warren Breakstone, chief product officer of data management solutions at S&P Global Market Intelligence.

Expanding alternative and unstructured datasets has been a key focus for the company and it has made several offerings available through Xpressfeed, including machine-readable corporate transcripts and additional SNL asset data. Over the coming months, the company will also deliver Trucost environmental, social and governance data and introduce a suite of sentiment and behavioral scores on top of unstructured text products, starting with earning call transcripts.

"While we're doing this, we will continue to enhance our Market Intelligence desktop solution, including unlocking some of Kensho's capabilities," says Breakstone. S&P Global acquired Kensho, a company that takes unstructured data and turns it into linked information, in a $550 million megadeal last year.

"As a data company we have vast troves of deep, historical and varied datasets, and it is vital that we provide clients with the capabilities to best access them, which is where Kensho comes in with its OmniSearch data-linking and search capabilities," says Breakstone.

Innovation will continue to occupy a central position in the company's 2019 strategy, he adds. "Clients are relying on us for the highest-quality content delivery and analytics, and we, as their partner, need to deliver at that highest level of expectation." wt

(L–R) Carlos Erdos, Viraj Patel, Danny Haydon and Lance Risi

> "Clients are relying on us for the highest-quality content delivery and analytics, and we, as their partner, need to deliver at that highest level of expectation."
>
> Warren Breakstone, S&P Global Market Intelligence

Best AI/Machine Learning Data Initiative

Truvalue Labs

The winner of the award for Best AI/Machine Learning Data Initiative has positioned itself at the epicenter of a major trend shaping the investment management industry: the rise in environmental, social and governance (ESG) integration.

Truvalue Labs specializes in applying artificial intelligence (AI) to uncover timely, material ESG information, and deliver analytics to investment managers seeking to quantify intangible factors that drive a company's value and performance. As the judges noted, "At a time when investors are demanding more socially conscious investments, Truvalue Labs brings a worthy application of AI for the purpose of advancing the cause of ESG investing."

The company was founded in 2013 with a mission to solve issues that investors and analysts had been facing with traditional sources of ESG data such as biased company reporting, non-material information and 'greenwashing'.

"A lot of ESG data is created based on company self-reported information," says Hendrik Bartel, CEO and co-founder of Truvalue Labs. "A company can put out any kind of information it deems to be ESG or sustainable to investors and ratings companies, and analysts who follow a specific methodology will derive insights out of that. We founded Truvalue Labs to use modern-day computing technologies to parse through massive amounts of unstructured data to create an 'outside look in' to companies."

By deploying machine learning and natural language processing technology, Truvalue Labs captures and analyzes news and information on more than 9,000 companies from over 100,000 non-company sources and millions of data points to compile an independent perspective of company ESG performance. Sources include industry-specific publications, regional and international news reports, government agency studies and reports from watchdog groups and non-governmental organizations.

Through Truvalue Platform, Truvalue Data and Truvalue Cloud, the company delivers objective measures, scores and insights by revealing value and risk factors that help investment managers evaluate companies, fulfill fiduciary duties and uncover new sources of alpha. The proof is in the numbers—an independent Harvard Business School study published in October 2018 found significant positive alpha of 4–5% annually could be unlocked by using a combination of Truvalue Labs' big data and traditional ESG ratings from MSCI.

Over the past year, the company has expanded its offering and has partnered with German index-engineering company Solactive to launch ESG index products. Looking ahead, Bartel says the company plans to expand its coverage into the fixed-income space and increase its language intake from seven—English, Portuguese, French, Italian, German, Spanish and Japanese—to 13, to include Nordic languages, Mandarin and Dutch. wt

> We founded Truvalue Labs to use modern-day computing technologies to parse through massive amounts of unstructured data to create an 'outside look in' to companies.
>
> Hendrik Bartel, Truvalue Labs

Best Big Data Analytics & Technology Provider

McObject

The award for Best Big Data Analytics & Technology Provider goes to McObject for its capital markets database management system, eXtremeDB High-Performance Computing (HPC), which aids financial firms in addressing the challenges of handling growing volumes of data with the lowest possible latency to support key application functions such as risk management, order booking and matching, and compliance.

eXtremeDB HPC is a full-featured database management system with support for industry standards including SQL, Open Database Connectivity and Java Database Connectivity for multiprocess concurrency and transactions that support the ACID—atomic, consistent, isolated and durable—properties. It is an embedded or in-process database system designed to be integrated within applications requiring little or no maintenance by end-users.

"McObject is the only company that has a server database for high-performance computing that originated out of embedded systems, which people call the Internet of Things (IoT) today," says Chris Mureen, COO of McObject. "There is a lot of synergy between what is happening today in IoT and what is being required in some of these high-performance computing server platforms in capital markets. Key is time-series data and the need to do high-performance analytics and build complex algorithms, which led us to enhance the product not only to have extremely fast data management, but to include 150 built-in vector-based math functions to build high-performance algorithms."

eXtremeDB HPC helps financial firms conduct analysis of both real-time and historical datasets—particularly pertinent for compliance with new regulations such as the Fundamental Review of the Trading Book (FRTB). It is estimated that FRTB, which has an implementation deadline of January 1, 2022, will require market participants to store and analyze 10 times more time-series market data than at present. For example, while risk is currently calculated at entity level, one of the stipulations of FRTB is for risk to be calculated at desk level, which will result in an unprecedented amount of data, analysis and reporting.

"McObject's eXtremeDB helps clients address this and other data-related challenges with its high-speed processing and ability to handle extremely large and complex time-series datasets," Mureen says.

Last year, eXtremeDB achieved record-breaking benchmark results when independently tested and audited by the Securities Technology Analysis Center (STAC), using the STAC M3 benchmark suite. The M3 benchmark is the industry standard for testing high-speed time-series data analytics. Mureen says: "Of these 17 tests, we set five new records for fastest mean response times, and for standard deviation or jitter, we set records for seven of the 17 operations." wt

> McObject is the only company that has a server database for high-performance computing that originated out of embedded systems, which people call the Internet of Things today.
>
> Chris Mureen, McObject

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Inside Reference Data
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Best Alternative Data Initiative

FactSet

The award for Best Alternative Data Initiative this year goes to FactSet, which has positioned itself as an integral part of the growing alternative data movement with its Open:FactSet Marketplace. Judges praised FactSet's approach of carefully gauging customer demand before developing a service with a sandbox for clients to "try before they buy", easing adoption of alternative data and time-to-market.

"We met with over 100 clients to better understand their challenges with identifying, integrating and analyzing alternative data, which helped us pinpoint the product that was needed. We found they needed more diverse datasets, but were struggling to find providers that met the rigorous standards of the financial industry," says Rich Newman, global head of the content and technology solutions group at FactSet.

Armed with this insight, FactSet began developing the Open:FactSet Marketplace, an online ecosystem leveraging FactSet's symbology and concordance to connect its data with carefully screened third-party providers.

"During the research phase, the challenge wasn't finding data firms eager to partner with FactSet, but prioritizing them. We identified and explored more than 500 potential providers and ranked them based on their relevance to clients' needs, data quality, subject matter expertise and synergy with existing FactSet solutions," says Newman.

In April 2018, FactSet launched the Open:FactSet Marketplace with 25 datafeeds of FactSet's core and alternative data, and data from third-party providers, including Alexandria Technology, Estimize, Prattle, RepRisk and Truvalue Labs, among others.

The service has now grown to offer more than 60 datafeeds with alternative content from companies including Mastercard, Thasos and IHS Markit—all stitched together with FactSet symbology. FactSet works with all providers to review and integrate their data before making it available, so users can seamlessly link datafeeds to their models, systems and proprietary datasets.

In July 2018, FactSet launched Data Exploration, which combines the Microsoft Azure cloud with data in the Open:FactSet Marketplace to offer users instant access to explore data in a fully hosted environment. Data Exploration eliminates the cost of trialing data locally by providing everything needed to analyze new content with a simple log-in, Newman says.

Since then, FactSet has introduced a Community Forum and also a Candidate Program, which allows clients to discover and evaluate potential new datasets before they become available as fully integrated products on the marketplace. All candidate providers are screened by FactSet before being accepted into the program. Newman says: "Open:FactSet Marketplace has been one of FactSet's most successful and exhilarating releases and it has created incredible energy—both internally and in our clients." wt

(L–R) Jaime Bickel, Rich Newman, Lauren Stevens, Lisa Knoll and David Mellars

> Open:FactSet Marketplace has been one of FactSet's most successful and exhilarating releases and it has created incredible energy—both internally and in our clients.
>
> Richard Newman, FactSet

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Quandl Nasdaq

Best Alternative Data Provider

Quandl

The alternative data sector is booming as hedge funds, quantitative investors and traditional fund managers seek non-traditional data sources to drive new insights, investment ideas and deliver alpha. At the forefront of this movement is the Toronto-based company recently acquired by Nasdaq—Quandl, which wins the Best Alternative Data Provider award.

Quandl provides alternative and core financial data to more than 30,000 active monthly users, and is used by eight of the top 10 hedge funds and 14 of the world's 15 largest banks. The company's alternative data business sources, evaluates and productizes data from non-traditional publishers and transforms it into quantified, actionable intelligence for institutional clients.

Carrie Shaw, Quandl's chief marketing officer, says what sets the company apart is that, while many alternative data aggregators seek comprehensiveness, Quandl seeks quality above all else, with only one in 100 datasets it evaluates ending up on the platform. Over the past three years, the company has added 50 alternative datasets, ranging from the sale of car insurance policies to point-of-sale transaction data.

The company's proprietary system encompasses a four-stage data process, from data sourcing and engineering to data science and delivery, and is designed to only surface exhaust data that is truly predictive of market movement. Once a dataset is selected, Quandl imports, cleans and structures the raw data, merges multiple datasets to generate insights, and maps the data to entities or tickers. All data is hosted on a single secure cloud platform and is offered to clients in their preferred formats, including Python, Excel or via an application program interface (API).

In 2018, Quandl invested in improving its entity mapping capabilities and is focused this year on building database integration so quantimental and discretionary investors who do not typically use an API can consume the data in ways that work best for them.

While Quandl is stealing a march as the go-to resource for alternative data, the greatest milestone for the company has been its acquisition by Nasdaq in 2018. Voted Acquisition of the Year by readers for this year's awards, the deal underscores the thriving interest among capital markets participants for non-traditional information and how Quandl is seen as a pioneer in the space.

As a result of this acquisition, the organizations have combined Nasdaq's Analytics Hub business with Quandl, which continues to operate under the Quandl brand. "We took the Analytics Hub datasets and pulled them onto our platform," Shaw says. "It was a smooth integration, and Quandl and Nasdaq are now pooling their resources and strengths to drive more value for institutional investors." wt

(L–R) Max Bowie, Tammer Kamel, Abraham Thomas and Bill Dague

> We took the Analytics Hub datasets and pulled them onto our platform. It was a smooth integration, and Quandl and Nasdaq are now pooling their resources and strengths to drive more value for institutional investors.
>
> Carrie Shaw, Quandl

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Best Corporate Actions Data Initiative
SmartStream

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SmartStream's Model Client Approach

SmartStream continues to be recognized for its innovation and best practices in corporate actions processing, winning this year's Best Corporate Actions Data Initiative award. *WatersTechnology* speaks to Robert Glassfield, SmartStream's TLM Corporate Actions Practice Manager, about its repackaged OnDemand service.

Q This year's win recognizes SmartStream's repackaged TLM Corporate Actions OnDemand service. How did the service come about and what has changed?

Robert Glassfield, TLM Corporate Actions Practice Manager, SmartStream: SmartStream's TLM Corporate Actions OnDemand came about following lengthy discussions with customers. While there is clearly a strong business case for introducing greater levels of automation into corporate actions processing, firms are still often cautious about doing so. They are concerned about cost, long implementation times, disruption to business and project failure. Of these, cost tends to pose the greatest worry.

Responding to market participants' feedback, SmartStream made its own corporate actions processing technology—TLM Corporate Actions—available in the cloud. TLM Corporate Actions OnDemand is readily accessible, without the need for a lengthy implementation phase, making it easy to adopt. It essentially provides financial institutions with a cost-effective and fast route to taking up the technology.

What is fairly new is the change to the engagement model. SmartStream is making it easier for companies to onboard the product through what it calls the "model client configuration." This is where clients can pick the elements of the TLM Corporate Actions OnDemand solution they require from a template, which enables them to tailor the solution to their individual requirements and further accelerates delivery. This has been designed with flexibility in mind and the success of this approach is reflected in the significant number of new sales made over the last year. A recent example is that of Coronation Fund Managers, one of the largest independent fund managers in South Africa.

Q What new features and capabilities has SmartStream added to TLM Corporate Actions OnDemand, and what difference have these made to clients so far?

Glassfield: SmartStream has made considerable investment in its corporate actions processing technology. The level of investment is reflected in the design of a number of new features, including the solution's user interface. The user interface deploys HTML5 screens and offers an attractive user experience; it is easy to navigate and presents data clearly while supporting flexible reporting. It has been very well received by customers, who have assisted in its development. Another newly introduced feature is the client portal, which allows for elections and their outcomes reviewed by a variety of different roles—for example, clients, portfolio managers and the front office.

SmartStream has also expanded its proxy voting capabilities, which provide users with the ability to create resolutions, pass them on to interested parties and then directly instruct their proxy servicer or their custodian via Swift messaging. In addition, SmartStream has added support for ISO 15022 and 20022 messaging standards.

Q How does SmartStream help corporate actions professionals address the challenges they face in their day-to-day activities?

Glassfield: Corporate actions processing is a time-sensitive and highly complex activity characterized by frequently changing event details. The increasing volume of events creates further pressure, especially when companies are still reliant on manual processes and legacy systems. Where missed corporate action events or erroneous elections occur, a company's bottom line can be impacted, and it must make good the losses its clients experience as a result of the oversight.

SmartStream's TLM Corporate Actions solutions provide automation and active alerting controls to address these challenges when processing all event types. The platform flags exceptions and discrepancies to clients who can then solve the issues they are being directed to.

Q When dealing with corporate actions, accuracy and timeliness are key—how does SmartStream ensure data captured from different sources is reliable and consistent?

Glassfield: SmartStream's solution automates the collection and scrubbing of event notifications received from external data sources including market data vendors, exchanges, custodians, depositories and counterparties to create a single rationalized event master—or a "golden record"—of information. Where required, SmartStream's system can prioritize a more trusted source over another, As the TLM Corporate Actions OnDemand solution is in the cloud, new information is consumed and validated in real time and, if no issues are identified, is passed downstream to interested parties.

Q What is next for TLM Corporate Actions OnDemand?

Glassfield: SmartStream will focus on the continuous improvement cycle for the model client configuration, whether that involves applying industry changes relating to ISO standards and regulations, or best practices defined by clients in their given markets. wt

Best Corporate Actions Data Initiative

SmartStream

SmartStream is no stranger to winning awards across the *WatersTechnology* portfolio. In the corporate actions processing space, it won Best Corporate Actions Solution Provider in the Waters Rankings last year, and follows that success by winning this year's Best Corporate Actions Data Initiative category.

This award is in recognition of SmartStream's repackaged TLM Corporate Actions OnDemand service, which allows organizations of all sizes to access the TLM Corporate Actions solution—which has been tried and tested, and is used by some of the world's largest financial institutions—with greater ease and speed through what the company calls "model client configuration".

Corporate actions processing is a notoriously complex, time-sensitive, event-driven process that is characterized by frequently changing event details, varying standards and interpretations, and multiple intermediaries. SmartStream's TLM Corporate Actions is an automated processing engine that covers the complete event life cycle with active alerting capabilities. It offers a diary management approach to processing all International Organization for Standardization (ISO) event types and automatically generates milestones, key tasks and processing exceptions, which it routes to the appropriate workflow points.

In 2011, SmartStream launched TLM Corporate Actions OnDemand as a Software-as-a-Service model. Clients who sign up for this service receive a fully hosted corporate actions processing platform from SmartStream's dedicated cloud environment. One of the biggest steps undertaken by the company since then has been the introduction of model client configuration.

"SmartStream has mutualized knowledge from its extensive client base and has combined that with industry standards and best practice to create the model client, which is a series of preconfigured components, from which clients can pick the elements of the solution they require. The model accelerates implementation times and reduces total cost of ownership," says Robert Glassfield, TLM Practice Manager at SmartStream.

The model client configuration incorporates as best practices all ISO event definitions and communications protocols, information provider and processing party interfaces along with Securities Market Practice Group and National Market Practice Group recommendations. In the past year, the company has signed up a dozen new clients for the service.

"Considerable investment has been made by SmartStream in its corporate actions processing technology," Glassfield says. For example, the solution has recently been expanded to include processing of ISO 20022 messages and support for their interoperability with ISO 15022 messages. Proxy voting capabilities have also been added. The company has also designed a new interface, which is easier to navigate and supports flexible reporting. wt

Eric Bigelsen

> SmartStream has mutualized knowledge from its extensive client base and has combined that with industry standards and best practice to create the model client ... [which] accelerates implementation times and reduces total cost of ownership.
>
> Robert Glassfield, SmartStream

Best Enterprise Data Management Initiative

Xenomorph

Xenomorph has been awarded Best Enterprise Data Management Initiative for its upgraded TimeScape EDM+ platform, recently deployed by Mizuho Americas, the US-based subsidiary of Mizuho Financial Group. The platform helps firms increase operational efficiency, improve risk management and adapt to new regulatory requirements. It manages the complete life cycle of data across integration, derivation, storage, cleansing, validation, audit, analysis and distribution. Clients can deploy TimeScape EDM+ on-premise or consume it as a cloud-based data management service.

Mizuho America had been a long-standing client of Xenomorph and used its enterprise data management (EDM) platform to normalize, enrich, validate and cleanse data that supported its trading and risk operations. Upgrading to the latest version of the platform running on Microsoft Azure has also armed the bank with a configurable workflow engine to help it respond quicker to new business requirements and evolving global regulatory standards.

"Xenomorph was traditionally strong at managing time-series data and analytics, with a flexible data model that enabled the system to manage any over-the-counter instrument, no matter how complex. We then added EDM workflow for data integration, normalization, validation, exception management, gold-copy creation and distribution, process audit and data lineage," says Naj Alavi, Xenomorph's managing director, Americas. "These capabilities are now being used to offer preconfigured solutions to specific business challenges, such as risk factor management, securities mastering, and trading and portfolio analytics."

TimeScape EDM+ includes a Data Validation Portal, which offers data validation and cleansing application functionality straight out of the box. TimeScape EDM+ also ensures that all data changes as well as process actions are fully audited so data provenance is guaranteed for both raw and calculated derived data. In addition, it tracks all dependencies of interlinked data, ensuring it is only promoted to gold status when the full dependency tree is satisfied. This means no dependencies are missed and everything is calculated in the correct order. Integrated analytics and in-built data and system connectors round out the TimeScape EDM+ feature set.

Looking ahead, Steve Tucker, Xenomorph's chief commercial officer, says the company is working on developing services for emerging regulatory-driven challenges. "One key driver lies in the new market risk framework being brought about as part of Basel III. Although the Fundamental Review of the Trading Book is not set for implementation until 2022, it will have significant implications for the way firms manage risk data. One example is the risk factor eligibility test. This rule really elevates the importance of data management because it impacts key business decisions and could make the difference to the viability and profitability of a trade." wt

> Xenomorph was traditionally strong at managing time-series data and analytics ... We then added EDM workflow for data integration, normalization, validation, exception management, gold-copy creation and distribution, process audit and data lineage.
>
> Naj Alavi, Xenomorph

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Best Corporate Actions Data Provider

SIX

Although there are always a few surprises in the *Inside Market Data & Inside Reference Data Awards*, the winner of this year's Best Corporate Actions Data Provider category isn't one of them. Switzerland-based SIX has won this award for 10 consecutive years—more than any other vendor in this category.

"Corporate actions is a top priority for SIX, and we focus on the quality, accuracy and timeliness of the data and what clients need to adapt to changing market conditions," says Annelotte De Nanassy, senior product manager at SIX. "The corporate actions business provides the foundation for a range of services and solutions offered by SIX."

SIX delivers integrated corporate actions data, drawn from over 1,500 sources globally, via the Valordata Feed, keeping customers informed on the latest splits, mergers, dividend payments and other critical corporate actions. Clients are able to choose the delivery channel, format—such as ISO 15022 and MT564—and notification mode that suits them to reduce operational and manual errors.

Where previously customers had to combine data from SIX, fund manufacturers and different specialist companies—all arriving in varying and difficult-to-integrate formats—SIX now works with more than 50 partners to deliver aggregated corporate actions data for a variety of technology platforms. It has also formed partnerships with companies including GoldenSource and IHS Markit, allowing it to integrate data into end-to-end enterprise data management services.

One of the company's big developments over the past 18 months has been the launch of SIX Flex—a new self-service data delivery system. SIX Flex offers customers a plug-and-play service with little to no technical integration work required. It has been designed to meet the needs of specific everyday business activities and contains a series of packages for clients to choose from. Each package comes preloaded with the data fields necessary for processing. Clients can determine how often they want the data, the templates they wish to receive and the way they would like to receive it. Data integration costs are also reduced through comma-separated value flat file delivery, says Laura Fuller, data consultant at SIX.

Currently, clients can choose from corporate actions events, cross-reference data, core reference data for the security master, end-of-day valuation prices and revised Markets in Financial Instruments Directive regulation packages. Over the coming year, SIX will focus on expanding the content packages.

Fuller says: "What makes SIX corporate actions unique is our continued focus on the quality of the data and on ensuring that our sources are optimal. We enhance data content, based on client feedback, to add value for our clients and ensure they receive the best service possible." wt

John McManus

> Corporate actions is a top priority for SIX, and we focus on the quality, accuracy and timeliness of the data and what clients need to adapt to changing market conditions.
>
> Annelotte De Nanassy, SIX

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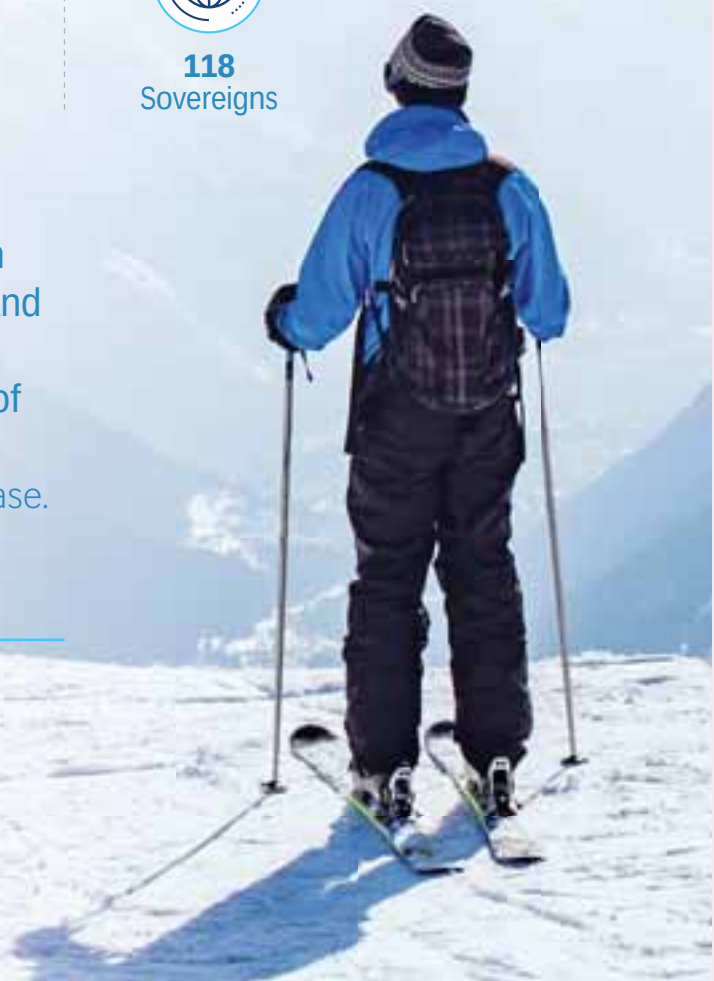

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Best Counterparty Data Provider

Fitch Solutions

Monitoring and managing counterparty risk has become more important than ever in a world of increasing cross-border payments, regulation, and macroeconomic and political risks. This year's award for Best Counterparty Data Provider goes to Fitch Solutions, a vendor that has continuously enhanced the data and analytics in its Credit Risk Solution to provide a powerful platform of actionable intelligence.

Paul Whitmore, product lead for the Credit Risk Solution, says: "Over the past few years, we have conducted hundreds of interviews and put significant time and effort into understanding what our clients' needs and pain points are in counterparty risk. Fitch Solutions has a wealth of data—hundreds of financial line items on banks, insurance companies, corporate ratings and corporate hierarchy—and clients want solutions that make sense of this data, which is what our Credit Risk Solution does."

The service has been available on the Fitch Connect platform since 2017 and boasts one of the longest-running bank fundamentals databases in the market. It has particularly strong coverage in Europe and the emerging markets—a valuable resource as developed market interest rates stagnate, keeping many investors searching for yield.

The Credit Risk Solution catalogs nearly 50,000 public and private institutions globally, with up to 30 years of historical records. Coverage includes more than 36,000 banks in 200 countries and 12,300 insurers in 150 countries.

Last year, the vendor launched Early Warning Signals, a series of user-configurable data panels containing key risk drivers with single-entity trend analysis capabilities, customized charting for multiple risk dimensions, and market signals for credit default swap pricing and implied ratings. "This allows users to quickly identify signals, both of deterioration and improvement in credit, and if further analysis or action is needed," says Evan Shenkin, head of product management.

In addition, Fitch's new user data management tool allows clients to input their own data into Fitch Connect, for use alongside Fitch's data to increase coverage or provide a different opinion for their analysis.

Fitch will make a raft of enhancements to the service over the coming months, including a bank scorecard, which will capture data, derived works and descriptive text from Fitch's bank rating criteria, and use its viability rating criteria in a judgment model. This will allow users to apply Fitch's criteria to unrated entities, generating a consistent view of an entire portfolio's credit risk.

Fitch will also introduce equity pricing, third-party ratings and a portfolio-level dashboard, which will help clients assess risk for all entities they monitor. "We are consolidating this data to give analysts a full 360-degree view," Shenkin says. wt

(L–R) Gilles Pelosato, Ian Mattinson, Kim Perlee, Kevin Dubreuil and Michael Nalaskowski

> Fitch Solutions has a wealth of data ... and clients want solutions that make sense of this data, which is what our Credit Risk Solution does.
>
> Paul Whitmore, Fitch Solutions

Best Data Analytics Provider

FactSet

FactSet retains its crown in the data analytics space after being named Best Data Analytics Provider for the fourth consecutive year. A vendor's ability to hold its spot in a competitive market speaks volumes about its ability to innovate and create products that continuously help clients to drive productivity and performance. This award also marks a double win for FactSet at this year's Inside Market Data & Inside Reference Data Awards, with its other in the Best Alternative Data Initiative category.

The company has evolved over the past 40 years from starting as a printed report—*Company FactSet*—to today providing more than 115,000 users worldwide with integrated data and analytics solutions across the investment life cycle. It first entered the portfolio management and analytics space in 1997 with the release of its Portfolio Analysis product. Since then it has expanded its product range with the overall aim of ensuring data is placed in context, with value-adding analytics layered on top.

"One area we targeted in 2018 was the development of key features for portfolio construction and management. This included enhancing and bringing our advanced risk analytics in real-time to the portfolio manager, through both new analytics models and a new Portfolio Manager Platform," says Rob Robie, head of analytics and trading solutions at FactSet.

Other key enhancements over the past year have included the availability of more exchange-traded fund (ETF) data and analytics, a new universal screening application, which integrates ETFs alongside equity, debt and activism data, improved search and analysis tools for company filings, and the addition of a wide range of new data sources—from US bank regulatory financial data to reputational risk data, including environmental, social and governance risk research and analytics on more than 110,000 public and private companies from developed and emerging markets.

The company also launched a cloud-based data testing platform, FactSet Data Exploration, which allows users to evaluate datasets and build investment applications using industry-standard programming languages in a fully hosted environment provided by Microsoft Azure.

This year, the company will continue to enhance both its risk and fixed-income analytics, Robie says. FactSet is also focused on enhancements that 'connect the dots' between content sets and surfacing insights for its users.

"Over the next 12 to 24 months, we are going to be very aggressive in terms of how we use our engines to derive and surface information that a user may not necessarily look for on their own," Robie says. "Having advanced analytics gives us that capability, and we will align that with technologies such as advanced application programming interfaces and machine learning through open ecosystems to do this." wt

(L–R) Lauren Stevens, David Mellars, Jaime Bickel, Rich Newman and Lisa Knoll

> Over the next 12 to 24 months, we are going to be very aggressive in terms of how we use our engines to derive and surface information that a user may not necessarily look for on their own. Having advanced analytics gives us that capability.
>
> Rob Robie, FactSet

Best Low-Latency Data/Technology Provider

Pico Quantitative Trading

As trading companies seek faster routes to market and quicker access to market data, technology providers are responding by advancing their networks and infrastructure. The award for Best Low-Latency Data/Technology Provider goes to Pico for its ultra-low-latency direct connectivity to major exchanges and its ever-expanding datacenter presence.

Low-latency connectivity to exchange market data can be costly and technically complex. It requires datacenter presence and, historically, a multilayer network infrastructure that adds additional latency. Pico offers a single-hop solution where clients can connect trading servers through a collapsed architecture via a single co-located Pico switch, receiving market data and sending orders at the lowest possible latency. Pico delivers this service as an outsourced solution, leveraging its expansive network, exchange and market data connectivity services, and its application management services in the cloud.

The company acts as a service provider and a licensed market data vendor of record, sourcing raw market data directly from a venue's lowest-latency and highest-bandwidth handoffs and delivers it over a low-latency, fault-tolerant fiber-optic network.

By using the single-hop solution—currently available at datacenters in Basildon (ICE) in the UK, Frankfurt (Eurex/Xetra) and CH1 (ICE) in Chicago—clients are able to access these markets in approximately 380 nanoseconds, significantly faster than the near-microsecond round-trip times of standard architecture.

Over the coming months, Pico plans to enhance the solution's performance by using new layer 1 switches. "We are also looking to extend the solution to other markets, and there are certainly opportunities in the Asian markets that we are expanding into," says Tim Williams, Pico's director of product.

Pico is located in 31 datacenters globally, covering more than 200 exchanges and trading venues across the Americas, the Asia-Pacific region (Apac), and Europe, the Middle East and Africa. Over the past year, it has increased its datacenter presence in Apac, which has enabled it to onboard and support clients that want to include the Asian markets in their global trading strategies. Over the next 18 months, Pico plans to add 20 more datacenters in countries including China, Australia, South Korea and India.

"For clients who want to start trading certain markets, coming on board with Pico gives them direct access to the ecosystem that we provide and easy access into trading markets that they don't have access to today," says Michael Verkuijl, Pico's global head of sales.

The company sets clients up quickly through the use of automated processes to enhance implementation tasks, and has dedicated teams to complete builds and changes, which reduces operational overheads for clients, he says. wt

Max Bowie (L) and Michael Verkuijl

> For clients who want to start trading certain markets, coming on board with Pico gives them direct access to the ecosystem that we provide and easy access into trading markets that they don't have access to today.
>
> Michael Verkuijl, Pico

Best Market Data Newcomer

Tradition Data

At first glance it may seem unusual that Tradition Data has been named Best Market Data Newcomer in this year's awards. After all, Tradition is one of the world's top interdealer broking firms and is awash with data emanating from its multiple trading platforms and venues.

But, while Tradition has sold market data for many years, it wasn't until 18 months ago that it began rebranding and relaunching the data business with Scott Fitzpatrick—previously global head of market data services at GFI Group—at the helm.

"We had a sales team that sold data being produced from our brokerage operations, but we didn't really have a clearly defined or coordinated strategy on how to maximize our opportunity globally; the business needed an identity that consumers could relate to. When you consider the global footprint of Tradition's brokerage business—the asset classes we cover and the countries we operate in—it is clear we have a lot to offer in the data space," he says.

Fast-forward to today and Tradition has formalized the structure of the data business, launched and marketed a new brand and created a new strategic approach. At a broad macro level, Tradition Data's objective is to make the consumption of its data as easy and efficient as possible for clients.

This includes a new model that addresses a common issue faced by data consumers—being forced to buy large amounts of data and being oversubscribed for the data they actually use.

Tradition Data, instead, offers modular or 'bite-sized' market data packages so clients only purchase the data they need. "If a client says they only want interest rate options data for a limited set of currencies in a particular region, then we are able to do that," Fitzpatrick says.

Previously, Tradition Data only licensed its data to third-party vendors for distribution. As part of the new strategy, it has launched Integrate, a new in-house delivery channel that offers real-time, end-of-day and historical data packages direct to customers, giving clients greater choice in how they access data.

In other developments, Tradition Data has expanded its range of distribution channels, and last year helped establish Bloomberg Capital Markets Package, a robust and dependable pricing and reference service for the interest rates swap market, with Bloomberg and BrokerTec.

The next phase of the business will be the launch of new products. "Now that we have the organizational infrastructure in place, the focus is on continuing to improve the depth and breadth of our products. We have some exciting initiatives, which we will be announcing soon, that will expand our coverage," Fitzpatrick says. wt

> The business needed an identity that consumers could relate to. When you consider the global footprint of Tradition's brokerage business—the asset classes we cover and the countries we operate in—it is clear we have a lot to offer in the data space.
>
> Scott Fitzpatrick, Tradition Data

Best Managed Service for Reference Data

Broadridge Financial Solutions

In recent times, there has been a decline in appetite for large-scale, on-site technology implementations, and vendors have released a range of managed services to clean and process reference data in response. The winner of this year's Best Managed Service for Reference Data award is Broadridge Financial Solutions—a long-established player in the field—which offers a combination of stand-out technology and operations services for clients.

Broadridge brings together a full suite of managed data services (BMDS) for buy- and sell-side clients spanning the acquisition, cleansing, consolidation, storage and distribution. BMDS encompasses both Broadridge's technology offerings and the operational processes to support them, including inbound and outbound feed setup and monitoring, reconciliations, quality management, exception processing, remediation and reporting.

"With the increase in regulatory demands for data transparency and accuracy, and the need to be much more efficient to be continually competitive in the marketplace, reference data needs to be combined in different ways—sometimes with longer histories—and packaged and processed quickly. By outsourcing to us the pain points of aggregating, cleansing, transforming and storing that data, clients are able to avoid the high costs and potential risks associated with these activities and focus their resources on business-differentiated activities," says Brian Crowley, managing director and general manager, Broadridge Investment Management.

The company's componentized services allow clients to target specific data management functions, and its service model is tied to service-level agreements and the type and volume of activities performed on behalf of clients, which boosts its appeal to a wider client base.

Ramprasad Sandilya, vice president, strategic solutions at Broadridge, says clients' business cases have expanded beyond reduction in total cost of ownership to include the mutualization of technology and innovation costs, quicker time to market when expanding services across asset classes, currencies and geographies, and the ability to scale operations with a predictable increase in costs.

Over the past year Broadridge has made a number of enhancements to its offering. For example, it has continued to improve its browser-based exception management dashboard and reporting workflow management system, giving clients greater transparency into the state of their data and the ability to interact in the process of cleansing and mastering their data.

"Clients can opt to be hands-off and have BMDS manage and deliver their data, but they can also choose to interact with the data, by managing and manipulating the validations and rules," says Crowley. He adds that Broadridge will continue to focus on extending the number of market data vendors it can receive data from. wt

> By outsourcing to us the pain points of aggregating, cleansing, transforming and storing that data, clients are able to avoid the high costs and potential risks associated with these activities and focus their resources on business-differentiated activities.
>
> Brian Crowley, Broadridge

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Best Reference Data Integration Vendor

Asset Control

The integration of reference data is vital for helping financial firms meet the reporting and data management demands of today's regulatory environment and to provide easily accessible and quality data for their business users. Asset Control's efforts to meet these requirements through its breadth of offerings and new capabilities, including its recently launched managed data service Asset Control Platform as a Scalable Service (AC PaSS), make it the winner of this year's Best Reference Data Integration Vendor award.

Asset Control's data management solutions provide data integration, cleansing, distribution and discovery services, helping clients address a rapidly changing market driven by increasing volumes, more rigorous demands on quality and cross-platform lineage, and stricter requirements on data management processes.

AC PaSS is a managed service deliverng the functionality of Asset Control's on-site AC Plus platform, but with the option to source data management operations on a use-case basis—such as revised Markets in Financial Instruments Directive post-trade reporting master data or independent valuations or processes to meet Fundamental Review of the Trading Book reference data requirements. The service appeals to a broader base of buy-side firms and banks that do not need the full scale and features of AC Plus.

AC PaSS includes last-mile integration, and testing against client-side integration and comes with service-level agreements to maintain service quality. In April, Asset Control announced AC PaSS was available in the Oracle Cloud Marketplace.

"We find a lot of clients have specific use cases for reference data and would like to avoid a complete revamp or overhaul of their infrastructure. Instead, they would like to augment what they already have," says Martijn Groot, vice president of marketing and strategy at Asset Control. "AC PaSS allows them to do this for one or more use cases at a time."

The company also launched ACX, a cloud-deployed data analytics, exploration and processing platform. Built on a structured query language Cassandra/Spark technology stack and using open-source components, ACX provides a range of options to access data coming from AC Plus and other data sources. Earlier this year, it launched Operations 360, a dashboard that offers an end-to-end view of data acquisition, derivation, cleansing and distribution through a control layer of these processes.

"Operation 360 is about tracking and tracing and providing end-users with insight into the status of data management processes at a glance. Users can zoom in on process metrics to identify and remove bottlenecks and optimize data cleansing. Any issues raised will immediately appear in the dashboard and the user can drill down and take corrective actions," says Groot.

To round off an extremely busy year, Asset Control moved to new ownership in September, with UK-based private equity firm Sovereign Capital Partners investing in the company. wt

(L–R) Fabrice Proust, Jessica Watson, Boyke Baboelal and Colin Tillar

> We find that a lot of clients have specific use cases for reference data and would like to avoid a complete revamp or overhaul of their infrastructure ... Instead, they would like to augment what they already have. AC PaSS allows them to do this for one or more use cases at a time.
>
> Martijn Groot, Asset Control

Best Reference Data Initiative

S&P Global Market Intelligence

S&P Global Market Intelligence wins the Best Reference Data Initiative award for its Cross-Reference Services, which seamlessly link reference data by company, sector and instrument, and significantly reduce the inefficiencies associated with manual assimilation of diverse datasets.

"Clients want to spend less time linking data and more time gaining insights. Our Cross-Reference Services' linking capabilities bring data together in a structured way to enable clients to get more out of the data," says Warren Breakstone, managing director and chief product officer of data management solutions at S&P Global Market Intelligence.

Cross-Reference Services comprise the Business Entity Cross-Reference Service (BECRS), the Global Instruments Cross-Reference Service (GICRS) and the Industry Sector Cross-Reference Service. All products have been built on the backbone of a shared data layer, which passes data to Xpressfeed and links every identifier to a unique S&P Global Market Intelligence identifier.

BECRS provides clients with cross-reference capabilities to millions of public and private entities using standardized and proprietary identifiers such as global legal entity identifier codes, ratings agency identifiers, Markit Red ID, D&B DUNS ID and Tax ID.

The company says that, prior to subscribing to BECRS, many clients manually maintained their own linking for mapping entities to issuers, which was a time-consuming and costly endeavor. With BECRS, clients can use S&P Global Market Intelligence's data mapping to systematically update and maintain the multifaceted relationships within a corporate hierarchy.

In addition, GICRS resolves the varying securities numbering problems in a global trading and processing environment. Clients can access a database of security identifiers cross-referencing more than 51 million global instruments. As a result, both middle- and back-office institutions can streamline their operations and create customized data-mapping systems for securities and trading items.

S&P Global Market Intelligence has consistently made enhancements to its Cross-Reference Services, and 2018 was no exception. For instance, it expanded BECRS' global legal entity identifier coverage to include the majority of issuing local operating units. It also extended GICRS' coverage from around 40 million to more than 50 million securities with additional asset types, including municipals, mortgage-backed securities, commercial papers and loans. Today there are more than 200 million locally and globally recognized identifiers.

Over the coming months, S&P Global Market Intelligence will continue to expand Cross-Reference Services' coverage to include more securities and identifiers, Breakstone says. Introducing more private companies will also be a key area of focus. wt

Lance Risi (L) and Carlos Erdos

> Clients want to spend less time linking data and more time gaining insights. Our Cross-Reference Services' linking capabilities bring data together in a structured way to enable clients to get more out of the data.
>
> Warren Breakstone, S&P Global Market Intelligence

Best Risk Data Aggregation Provider

S&P Global Market Intelligence

A multitude of factors can quickly change the credit health of counterparties and investments, from global slowdowns to supply-chain disruptions and new regulations. In today's complex markets, vendors that offer deep views of credit risk and sophisticated analytics models and workflow tools have become invaluable. S&P Global Market Intelligence has made great strides with its Credit Analytics solution for global counterparty credit risk analysis and wins Best Risk Data Aggregation Initiative.

Credit Analytics brings together financial and market data with credit scores, modelling tools and credit-specific data to deliver a powerful platform for users looking to run risk analysis on rated, unrated, public and private companies. The service is used by buy- and sell-side firms, as well as lending institutions, insurers and corporations.

According to Whit McGraw, managing director of credit solutions, one of the most demanding challenges credit risk analysts face is a lack of globally consistent and universally comparable analytics. Credit Analytics helps by providing access to both fundamental and alternative data to assess credit risk where fundamental data is missing.

Over the past 12 to 18 months, the company has developed a raft of enhancements to the service to help companies better manage and aggregate risk. These include an aggregate dashboard that analyzes risk factors across a custom list of counterparties. These risk scores are visually displayed across global heat maps, as well as industry drill-downs and risk score distributions. Aggregate statistics are provided to understand the overall risk of a portfolio, and an alert functionality lets users monitor deteriorations in credit quality and be notified according to their preferences.

Other recently added features include a Macro Scenario Analysis tool, with stress-testing capabilities on several macro factors, such as GDP growth, unemployment rates and index levels, which users can adjust to see the impact on the creditworthiness of a company. Users can also run 'what-if' scenarios—including Brexit-like simulations—to understand how each scenario may impact their focus companies.

Earlier this year, the company increased coverage to more than 2.8 million companies through its Expanded Probability of Default (PD) methodology. Alongside the imputation methodology for partial financial statements, Expanded PD forms part of S&P Global's Universal PD framework, which helps users produce risk assessments for counterparties based on limited financial data.

Looking ahead, McGraw says the company will add "small and medium-sized enterprise fundamental data and alternative datasets to strengthen our coverage, new analytics on alternative data to provide key insights and early warnings, and we will continue to build tools that drive greater efficiencies into the workflows of our clients". wt

Danny Haydon (L) and Viraj Patel

> We will continue to build tools that drive greater efficiencies into the workflows of our clients.
>
> Whit McGraw, S&P Global Market Intelligence

Best Reference Data Newcomer

Derivatives Service Bureau

The Derivatives Service Bureau (DSB) wins this year's award for Best Reference Data Newcomer for its collaborative efforts with the over-the-counter (OTC) derivatives industry. DSB helps market participants meet European regulatory reporting requirements through its International Securities Identification Numbers (ISINs) generator solution and other initiatives.

DSB offers a fully automated platform that allows users to create OTC derivatives ISINs and obtain associated reference data. The company was established by the Association of National Numbering Agencies in 2017 in response to the European regulatory mandate for ISINs to be used for uniquely identifying and reporting OTC derivatives under the revised Markets in Financial Instruments Directive (Mifid II), which came into effect on January 3, 2018.

"The DSB's OTC ISIN solution was fundamental for participants trading OTC derivatives to meet their Mifid II reference data reporting obligations," says Malavika Solanki, a member of the DSB management team. "Through extensive collaborative work with market participants, regulators and other standards bodies, DSB delivered the OTC ISIN solution under budget and three months ahead of schedule."

The first users for the generation of ISINs were onboarded in October 2017, marking the beginning of a global OTC ISIN data archive that also contains Classification of Financial Instruments, Financial Instrument Short Name and other associated reference data. Users can access the service either through a web interface or via direct integration to their front-office systems.

"Since the start of 2018, the industry has rapidly adopted the service to meet other regulatory reporting needs in addition to the original Regulatory Technical Standard (RTS)-23 requirement—including Mifid II's RTS-2 and RTS-22 reporting requirements—and European Market Infrastructure Regulation level III reporting," Solanki says.

The platform was originally intended for use for standardized OTC derivatives but, at the request of industry participants, DSB has expanded its offering to include 12 non-standard templates and three multicommodity exotic templates to support a broader spectrum of instruments traded by banks and asset managers.

Today, trading venues, banks and the buy side are able to use DSB-generated data instead of having to maintain complex algorithms to generate bespoke identifiers, and the service is used by 2,000 users spanning almost 400 institutions in 33 countries.

In a further endorsement of DSB's work, the Financial Stability Board announced in May that it had selected the firm to be the service provider for the future Unique Product Identifier (UPI) system. As the sole issuer of UPI codes, which will identify the product in OTC derivatives transaction reporting data, DSB will also act as operator of the UPI reference data library. wt

(L–R) Emma Kalliomaki, Malavika Solanki and Scott Preiss

> "Through extensive collaborative work with market participants, regulators and other standards bodies, DSB delivered the OTC ISIN solution under budget and three months ahead of schedule.
>
> Malavika Solanki, Derivatives Service Bureau

Best Real-Time Data Initiative

Exegy

Exegy wins this year's award for Best Real-Time Data Initiative for Signum, its portfolio of real-time trading signals designed to optimize the performance of agency execution and principal trading applications.

With a background in providing technology and managed services for the normalization and distribution of real-time market data, Exegy has positioned Signum as a Signals-as-a-Service offering driven by machine learning technology. The set of signals—presently for the US equities markets—includes the real-time detection of reserve orders, estimation of reserve order volume, predictions of price durations and next-tick direction.

Signum delivers signals for all securities synchronously to real-time market data events, which results in millions of signals being produced every day that provide opportunities for firms to capture new alpha and to improve execution quality, says David Taylor, Exegy's CTO. Exegy has built up a team of data scientists and engineers and has invested years in developing the service.

The signals include Signum Liquidity Lamp, which detects and tracks concentrations of execution activity driven by the presence of reserve or iceberg order types, and Signum Searchlight, a companion signal that enables trading applications to respond to the Liquidity Lamp signal and correctly predicts liquidity pool size 75–80% of the time. These signals are useful for smart order router applications to improve fill rates and execution quality, and liquidity-seeking algorithms that target multiple levels of a price book.

Other signals include Signum Quote Fuse, which predicts the duration of the national best bid and national best offer prices when a new price is established—specifically, it predicts whether a price will change sooner or later than a configured threshold—and Signum Quote Vector, which predicts the direction of the next change to the national best bid and national best offer prices. As a fully managed solution, Exegy delivers reports on signal performance to users via a web portal.

Looking ahead, Taylor says Exegy will expand its signal portfolios and apply them to new asset classes, including derivatives and foreign exchange.

"We have invested a lot of time to get the data science and machine learning working for US equities, and taking this to other asset classes will require mainly a retraining of the models to make the signals work in those markets," says Taylor. "We are also working on signals for longer time horizons based on the output of the real-time signals. We have seen demand for this, particularly from buy-side clients that have longer holding periods and want us to make longer-term predictions." wt

(L–R) Max Bowie, David Taylor and Andy Lee

> We have invested a lot of time to get the data science and machine learning working for US equities, and taking this to other asset classes will require mainly a retraining of the models to make the signals work in those markets.
>
> David Taylor, Exegy

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Searchlight

» Estimates the size of reserve order volume resting on US equity exchanges.

Quote Vector

» Predicts the direction of the next NBBO price change for US equities.

Signum "Signals-as-a-Service" presents the fastest, lowest cost opportunity to leverage machine learning technology to enhance trading performance — delivering signals for all securities synchronously to real-time market data events.

Learn how **Signum** can optimize the performance of your firm's agency execution and principal trading applications - *today*. Contact us to learn more.

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Most Innovative Market Data Project
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Inside Market Data & Inside Reference Data Awards Winner 2019
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exegy

Most Innovative Market Data Project

Exegy

The win in this category by Exegy marks a double-header for the company in this year's *Inside Market Data* & *Inside Reference Data* Awards, with the other win in the Best Real Time Data Initiative category. While both awards recognize the innovativeness of the company's newly launched trading signals service, Signum, the award for Most Innovative Market Data Project is for the company's collaborative work with clients in developing the service.

Exegy has provided technology to the market data industry for 13 years, and its roots go back further to when it was founded as a technology start-up at the School of Engineering at Washington University in St Louis in 2003. In 2006, the company launched a field-programmable gate array-based ticker plant that normalizes and distributes real-time market data to trading applications.

"When we brought that to market, we made some decisions that really play into the way we are rolling out Signum today," says David Taylor, CTO at Exegy. "We essentially wanted to deliver all of the value of the technology without exposing any of the complexity. This meant deploying the ticker plant as a managed service and giving clients a software application program interface to consume the data that came out of it. This was a successful model and we had early adoption by banks' principal trading desks."

Since then, the company has expanded its product line and grown its client base to include market-makers, sell-side banks, asset managers and proprietary traders. More recently, clients began talking to Exegy about the possibility of the company applying data science and machine learning to develop trading signals and delivering them as a fully managed solution. "A lot of the demand came from our sell-side clients who said they wanted these tools to improve execution quality and reduce risk, but didn't have the resources to do the data science and build them into their infrastructure. They were looking for a Signals-as-a-Service offering and saw that as our strength," says Taylor.

Exegy has spent more than two years developing Signum's trading signals in concert with several of its largest clients, and the offerings have now entered an early adopter evaluation phase, with clients carrying out their own integration work and test cycles to bring the signals into production.

The current set of Signum signals for the US equities markets includes Signum Liquidity Lamp, for real-time detection of reserve or iceberg order types; Signum Searchlight, for estimation of reserve order volume; Signum Quote Fuse, for predictions of price durations; and Signum Quote Vector, for next-tick direction. As a managed solution, Exegy delivers reports on signal performance to users via a web portal. wt

Andy Lee (L) and David Taylor

> A lot of the demand came from our sell-side clients who said they wanted these tools to improve execution quality and reduce risk ... They were looking for a Signals-as-a-Service offering and saw that as our strength.
>
> David Taylor, Exegy

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Best Research Provider

BlueMatrix

In past years, many of these awards were taken home by a small number of the largest data providers. This year—reflecting today's diverse financial information ecosystem—there are some inaugural recipients, including the winner of the Best Research Provider award, BlueMatrix.

BlueMatrix's position in the market is neutral, and it follows the founders' vision for the equitable exchange of investment insights, connecting asset and wealth managers with close to 1,000 research firms across more than 50 countries.

"When we started in 1999, there was a need to automate the production of research, which was cumbersome and labor-intensive. Sending research was manual and was done with a different interface for each aggregator," says Patricia Horotan, co-founder of BlueMatrix. "Our initial clients were tier two and investment banks, and boutique and independent research firms, and we helped these smaller firms compete with the bulge-bracket players. They could write the research and distribute it just as fast but spend less money doing this, and this is how we grew."

BlueMatrix provides a suite of services and tools for the publication, dissemination, consumption and evaluation of investment insights. Reports are automatically formatted for preselected outputs such as PDF or HTML5, which can be custom-designed to showcase a company's brand, and simultaneously distributed via email to aggregated research vendors and internal libraries for browser and mobile accessibility. Distribution has been built into the process through the platform's customer relationship management (CRM) capabilities or via integration with a client's preferred CRM system, and users can protect their intellectual property through controlled distribution that restricts accessibility and forwarding on a case-by-case basis, while showing readers' identities.

BlueMatrix completes the feedback loop with real-time readership data that analysts can use to drive future research. The built-in analytics module features an interactive dashboard with granular insights and trends about who is reading the research, who is disengaged, and the most popular analysts, reports and regions.

Regulation such as the second Markets in Financial Instruments Directive (Mifid II), which requires research to be priced separately from execution, has boosted the use of BlueMatrix's platform, Horotan says. "Buy-side firms have to show investors what they are consuming. They want to track and lock down the consumption of research and can use our platform to do this. On the sell side, Mifid II has fueled a more competitive environment, and our distribution and readership—plus the ability to use our readership data to help quantify the value of their research—has become more of a must-have than a nice-to-have for sell-side and niche research providers." wt

(back, L–R) Jeremie Bourque, Simon Edwards, Paul Lankowicz, Steve McNally; (front, L–R) Patricia Horotan, Ana Ciubancan and Tara Tripoli Umstead

> On the sell side, Mifid II has fueled a more competitive environment, and our distribution and readership—plus the ability to use our readership data to help quantify the value of their research—has become more of a must-have than a nice-to-have.
>
> Patricia Horotan, BlueMatrix

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Best Supporting Services Provider

Axon Financial Systems

Keeping up to date with market data obligations and understanding where data goes once it has entered an organization are essential to remaining compliant with exchange policies and avoiding excessive fees.

Axon Financial Systems, judged the winner of the Best Supporting Services Provider award for the second consecutive year, takes its role beyond consultancy and offers clients a full portfolio of product-based services to support understanding of—and compliance with—the rules, pricing and policies of exchanges, freeing up market data teams to focus on more valuable activities.

At the heart of Axon's offering is its Policies, Explanations, Analytics, Repository (PEAR) platform—an online self-service portal that contains standardized, searchable datasets of regulations, rules and pricing for exchanges and other data content originators. "PEAR reduces the time needed to source and understand the many market data policies and pricing models of exchanges, and keeps users up to date with the latest announcements from a database of around 220 markets," says Aaron Garforth, Axon's CIO and co-founder. The company monitors more than 600 exchange documents daily.

Other services in Axon's armoury include the outsourced Declaration Service (ADS), where Axon takes on the exchange and vendor reporting responsibility for clients. ADS automates the time-consuming elements of preparing exchange and vendor declarations through the implementation of exchange rules sourced from PEAR and client-specific rules sets. "This systematic approach removes repetitive manual processes, leaving the client in control of the workflow and approvals," Garforth says.

The company also offers an Application Compliance Tool (ACT), an online bespoke questionnaire that helps clients profile their proprietary applications' market data usage through regular recertification. By connecting with PEAR, ACT provides a view of the exchange compliance obligations for a firm's applications, allowing users to quickly identify licensing and policy requirements.

Over the past year, Axon has focused on developing add-ons to the PEAR database. These include a PEAR application programming interface, which gives clients access to PEAR's data in a machine-readable format for use in their own systems and processes, and COMPEAR, which enables users to compare previous exchange documents with the current versions side by side. Particularly useful is its ability to highlight what has been removed or changed in the previous document and what has been added in the new one.

The company has also launched the Axon Declaration Portal (ADP) this year, a service aimed at exchanges and vendors to help them collect and manage their customers' market data usage declarations. ADP automatically sends out reminders and merges the client data into a central database for any exchange or vendor that is deploying the portal. wt

(L–R) Steve Crowler, Aaron Garforth and Chris Hutton

> PEAR reduces the time needed to source and understand the many market data policies and pricing models of exchanges, and keeps users up to date with the latest announcements from a database of around 220 markets.
>
> Aaron Garforth, Axon Financial Systems

Most Innovative Regulatory Solution

NeoXam

Recent times have seen increasingly stringent regulatory requirements come into play, which are transforming the way financial firms interact with and manage data. Regulations such as the revised Markets in Financial Instruments Directive are increasing the scope of regulatory reporting, while the Fundamental Review of the Trading Book (FRTB) requires firms to manage at least 10 years of historical prices and associated metadata to comply. This means they need to strategically plan for and consistently manage data flows with a reliable monitoring system based on a single, centralized source of data. Fortunately, NeoXam has a service that will help, which earns it this year's Most Innovative Regulatory Solution award.

"When FRTB is implemented, a vast amount of market data is going to be required on a daily basis. Not only is the consolidation of this important, but market data costs could soon spiral out of hand if there isn't an optimized process in place," says Yann Bloch, vice president of product management at NeoXam.

NeoXam DataHub is made up of a set of functional modules that provide clients with a single manageable source of data. It can be deployed in several ways: from enterprise on-premise to cloud-hosted to a managed service—which takes the low-level system and application management burden off customers and allows them to focus on value-added business operations. "DataHub also provides regulatory reporting services on an industrial scale and ensures clients are constantly kept up to date with the latest regulatory requirements via our round-the-clock regulation watch," Bloch says.

Last year, Münchener Hypothekenbank went live with NeoXam DataHub to house all its data and administration in a single platform to help it address upcoming regulatory requirements. By using DataHub, the bank is able to automatically process all the data it uses and reduce the level of operational risk by providing a clear audit trail and improved data quality.

NeoXam also recently launched Regulatory Edition, a feature of its new reporting solution, NeoXam Impress. The firm is also pursuing a machine learning initiative after receiving a Finance Innovation Accreditation from the French public authorities. To achieve this, NeoXam worked with consultants to discover the most critical issue for their clients. For asset managers, this was data quality. Having to consolidate large amounts of data from different data providers was causing some issues when it came to data classification. "Artificial intelligence, and machine learning in particular, can help identify data quality issues by recognizing unusual patterns in time-series data, for example," Bloch says.

This year, Bloch says NeoXam will be further developing the cloud integration aspect of its data management services in response to an overwhelming trend towards cloud migration among its clients. wt

Amanda Carignan (L) and Chris Violandi

> DataHub ... provides regulatory reporting services on an industrial scale and ensures clients are constantly kept up to date with the latest regulatory requirements via our round-the-clock regulation watch.
>
> Yann Bloch, NeoXam

Best Data Governance Solution

State Street Global Exchange

Financial institutions face a multitude of data-related challenges involving quality, accessibility and security. These can have serious effects on virtually all aspects of a business. With a growing need for data governance—the management of the availability, usability, integrity and security of data employed in an organization—many companies view the process of implementing such a program internally as a large-scale undertaking.

The winner of the Best Data Governance Solution award—State Street Global Exchange—offers a solution ahead of the curve when it comes to providing effective data management and governance: DataGX. With DataGX, the company offers a secure, scalable, private cloud-based Data-as-a-Service platform that encompasses data governance, quality and security.

"Successfully applying effective data governance has become increasingly challenging in a world where data and multi-asset class investment management strategies are growing. Financial institutions need to invest in their platforms, operations and governance process, but this is a struggle because of the amount of investment that is needed at that scale," says Subbiah Subramanian, global head of DataGX. "State Street has that scale, providing data management and governance capabilities across dozens of clients globally."

DataGX manages clients' data from any service provider, vendor or client platform to create a holistic and integrated view of holdings, cash, security master, performance measurement, risk and other critical information. Through its Operational Control Framework for end-to-end data quality management, the system performs preventive checks to interrupt processing when key issues are identified; detective checks to alert State Street's operations team of potential concerns; and intraday checks, which monitor and provide insight into the overall health of a client's data.

Central to good data governance is visibility into the provenance and lineage of data, and DataGX features extensive data lineage capabilities, allowing clients to track where data came from and where it is delivered. The control framework and data lineage capabilities are supported by constant monitoring and maintenance by the DataGX team.

Last year, the company launched DataGX Direct, which provides clients access to their data in a database that sits within State Street but outside its firewalls. "We do the heavy lifting of data management within State Street, but if clients have to take that data and load it into their own data management platform, they are essentially creating a copy. With DataGX Direct, all the data is validated and we push that information to a normalized database that becomes the client's warehouse," says Subramanian. He says State Street will continue to evolve DataGX's functionality, for example, by enhancing its automated data validation tools and the engines that take in multiple sources of securities. wt

(L–R) Eric Lapham, Amanda Brady and Matthew MacLean

> "Financial institutions need to invest in their platforms, operations and governance process, but this is a struggle because of the amount of investment that is needed at that scale ... State Street has that scale, providing data management and governance capabilities across dozens of clients globally."
>
> Subbiah Subramanian, State Street Global Exchange

Best Market Data Provider (Vendor)

Refinitiv

Thomson Reuters last year topped the reader survey for Best Market Data Provider (Vendor) after a 14-year reign in this category by Bloomberg. This year, Refinitiv—formerly the financial and risk business of Thomson Reuters—continues that success.

Refinitiv stands out for its data quality, depth of coverage and continuing enhancements to the Elektron Data Platform. "Our content and infrastructure are, without doubt, what our customers value—and the fact that we consistently provide a reliable service that expands year after year to reflect market needs," says Marion Leslie, managing director of Enterprise at Refinitiv.

Over the past year, Refinitiv has continued to deliver new content sets on Elektron, which now carries 84 million instruments. "We are always looking to increase our exclusivity and unique datasets," Leslie says. "For example, we are the only data provider to carry Tradeweb and MarketAxess data, which strengthens our proposition in the fixed-income space."

Refinitiv added hundreds of new datasets to Elekton in 2018, through the onboarding of new venues and by enhancing existing sources. "As markets grow and become more transparent, we will seek to make that data available to customers," says Leslie, adding that emerging markets data and cryptocurrencies have been particular areas of focus for the company over the past year.

From a technology standpoint, a big shift for Refinitiv has been in making its data accessible in the cloud. This enhancement to Elektron provides users with access to real-time data on the Amazon Web Services cloud, with work under way to expand its global footprint to improve service quality for customers.

"Moving to the cloud democratizes access to our data and reaches a whole host of new types of customers who previously haven't wanted to invest in on-premise infrastructure," says Leslie. "We are giving clients increased flexibility in how they use the data, whether they need it on-premise, as a managed service or in the cloud."

While Refinitiv has made a major leap already, it will continue to make enhancements and provide access to a wider range of data outside of real-time in the cloud.

Refinitiv will also continue to enhance its content assets, adding, on average, 100 new datasets per month, and will ramp up its Tick History data service, for which it is seeing growing demand. "Everything that we carry on the Elektron network is made available through Tick History, and we are seeing a huge appetite for that data, whether it's for regression analysis, stress testing, scenario planning, new product development, risk management or data science," says Leslie. wt

> Our content and infrastructure are, without doubt, what our customers value—and the fact that we consistently provide a reliable service that expands year after year to reflect market needs.
>
> Marion Leslie, Refinitiv

Best Market Data Provider (Exchange)

CME Group

The headline news for CME Group last year was its $5.5 billion acquisition of NEX Group, creating a trading venues giant spanning futures to Treasuries and foreign exchange (FX). With the two organizations' market data businesses combined, CME Group has also emerged as a data powerhouse and tops this year's reader vote for Best Market Data Provider (Exchange).

"We are very excited about the opportunities that NEX brings to CME Group's data business and our combined client base," says Trey Berre, global head of market data services at CME Group. "Offering both cash and futures market data allows us to develop a comprehensive set of data products that will provide new and greater insights and trading opportunities for our customers."

As an example, Berre points to the launch of the BrokerTec US Treasury display in the Bloomberg Capital Markets Package (BCMP) that gives customers the ability to access US Treasury price discovery sourced from the fixed-income trading platform that CME gained as part of the NEX acquisition. "We are now extending that capability by combining CME derivatives information with BrokerTec over-the-counter information into the BCMP service," Berre says.

CME has also made several of NEX's products available on DataMine—its historical market data platform—including historical data derived from EBS Market's FX matching platform and the GovPX US End-of-Day Pricing Service. In addition, CME will make the first real-time BrokerTec market datafeed available this summer.

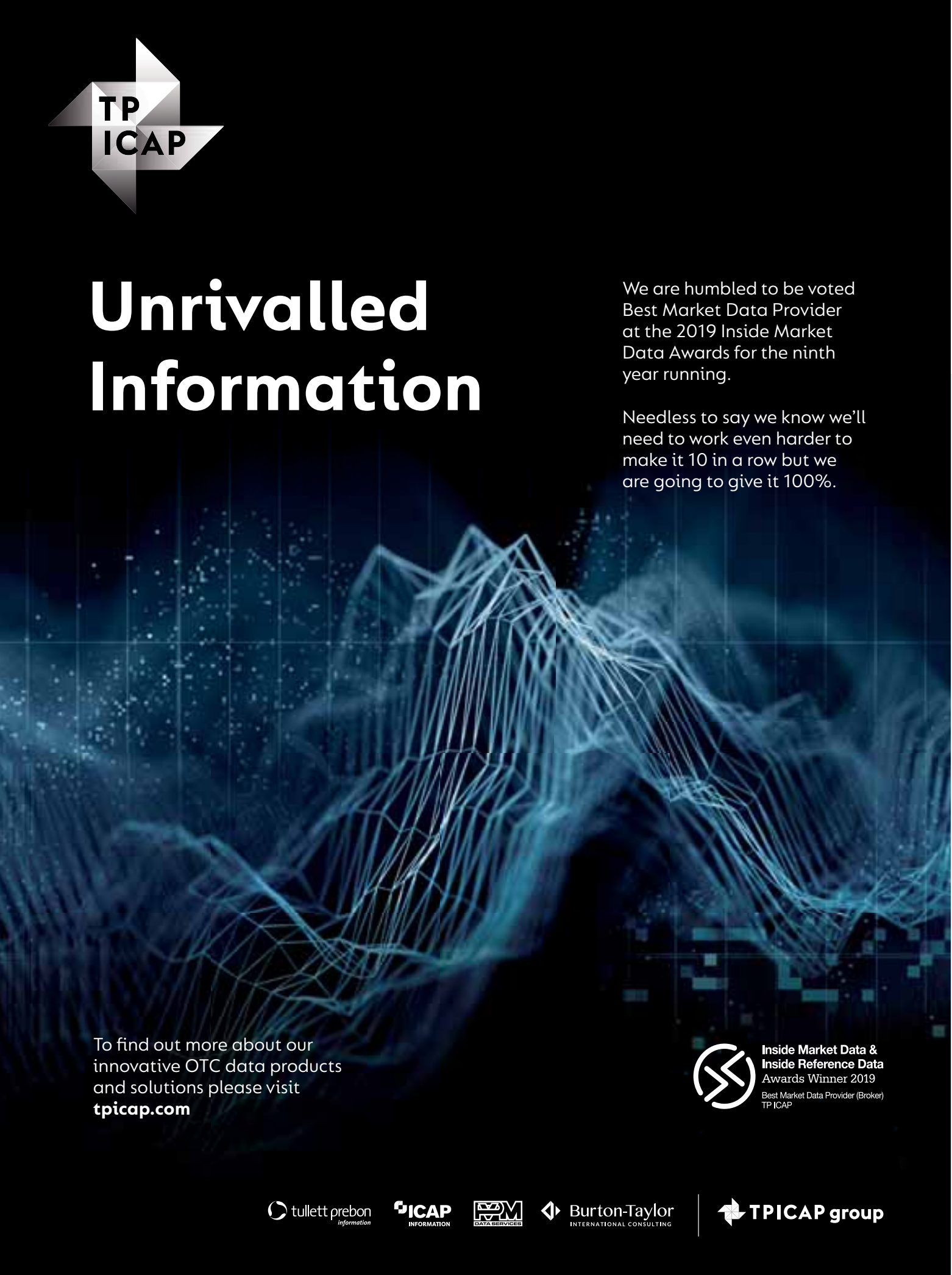
In other initiatives, CME last year launched a settlement and valuation streaming data service for all futures and options, providing a single source for valuations, high/low prices, volume and open interest of all CME products. It also introduced alternative datasets in DataMine for the first time, including satellite imagery and implied volatility measurements, and launched an artificial intelligence (AI) service called Order Book AI, which helps users identify market patterns in 12 of its most actively traded futures contracts.

"The last year has really been about delivering choice to our clients, providing efficient access, and shortening the time it takes between selecting a data service and accessing it," Berre says.

An important area of focus for the exchange over the coming months will be derived data—the ability of an institution to use CME data to create new products and services for their own customers' investment or risk management objectives.

"We also see an opportunity to grow our analytics in both real time and historical data, which includes the integration of NEX datasets," Berre adds. "Ultimately, the new products and services we offer will create richer data for our end-users." wt

> Offering both cash and futures market data allows us to develop a comprehensive set of data products that will provide new and greater insights and trading opportunities for our customers.
>
> Trey Berre, CME Group


TP ICAP
Unrivalled Information
We are humbled to be voted Best Market Data Provider at the 2019 Inside Market Data Awards for the ninth year running.
Needless to say we know we'll need to work even harder to make it 10 in a row but we are going to give it 100%.
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Best Market Data Provider (Broker)

TP ICAP

Once again, TP ICAP is the recipient of the Best Market Data Provider (Broker) in this year's Inside Market Data & Inside Reference Data Awards, as voted by readers, making it the winner of this category an incredible nine times.

Perhaps the secret to the firm's enduring success in these awards lies in the fact that it is not one that stands still. Two years ago, Tullett Prebon completed its acquisition of ICAP's global hybrid voice-broking business, creating a broker powerhouse with an extensive information product suite. Shortly after, it bought market research firm Burton-Taylor International Consulting. While Tullett Prebon laid low on the acquisition front last year, it nevertheless occupied itself with a root-and-branch review of its data and analytics division, which led to the creation of two global teams with clients and the vendor user-base very much front of mind.

The first is a channel management team—sitting in Asia, the US/Americas and Europe—that works collaboratively with the vendor community. "We are seeing lots of new market participants wanting to access our data and provide solutions and services to our mutual customers," says Chris Dearie, COO of TP ICAP Data & Analytics.

"We have created a dedicated team that specifically manages those types of relationships—from the biggest vendors to the more niche, asset class-specific suppliers of software or services."

The business has also created a global product management team, tasked with creating and delivering new products following consultation with customers. Previously, TP ICAP's Data & Analytics division launched three or four products a year. Since the team's formation, it has launched four products in the second half of 2018 and seven in the first quarter of this year, ranging from commodity options to Dutch power, Treasury trade history and inflation data. It is likely to finish 2019 with around 15 new datasets, Dearie says.

Other products brought to market over the course of 2018 include Scandinavian and Pacific cross-asset regional data packages, and two data packages for derivatives linked to the Secured Overnight Financial Rate index—the alternative to Libor—sourced from TP ICAP's broking businesses. The Data & Analytics division also embarked on a partnership with analytics company Credit Benchmark to produce a credit proxy solution.

Looking ahead, Dearie says the business will continue to build out the product management team by bringing in specialists to create value-add data services for customers in areas such as risk, benchmarks and indices. It also plans to launch cloud-based data services in the second half of this year in response to clients' increasing interest in accessing data through this channel. wt

(L–R) Nicole Spyropoulos, Marie O'Neill, Kim Raney, Martin Walters Thomas So and Sean Cole

> We are seeing lots of new market participants wanting to access our data and provide solutions and services to our mutual customers.
>
> Chris Dearie, TP ICAP

Acquisition of the Year

Nasdaq's Acquisition of Quandl

Nasdaq's acquisition of Quandl—which won Best Alternative Data Provider in this year's awards—has topped the reader vote for Acquisition of the Year.

The exchange group's announcement in December 2018 that it had acquired the Toronto-based company underscores its strategy to expand beyond its traditional services such as listings into the fast-growing areas of market data and technology. Its other recent acquisitions include buy-side behavioral analytics specialist Sybenetix, investment analytics provider eVestment Alliance and trading technology provider Cinnober.

"We are already one of the leaders in technology for other exchanges and marketplaces, and a leader in traditional financial exchange data," says Bjørn Sibbern, executive vice president for Nasdaq's Global Information Services. "We want to grow our data and index business, so adding other types of data—in this case alternative data—is the natural thing for us to do. Firms need smarter data for investment decision-making, and we believe alternative data will become must-have data for the buy and sell sides. We look at many companies in a year, and Quandl was such an obvious acquisition for us because of its leadership in the alternative data space."

Quandl provides alternative data and core financial data to more than 30,000 active monthly users, and is used by eight of the world's top 10 hedge funds and 14 of the 15 largest banks. The company's alternative data business sources, evaluates and productizes data from non-traditional publishers and transforms it into quantified, actionable intelligence for institutional clients. The company—which will continue to operate under the Quandl brand and management team led by CEO Tammer Kamel—will be integrated into Nasdaq's Global Information Services business by the end of the second quarter of this year. As part of the deal, Nasdaq has integrated its Analytics Hub—which also provides alternative datasets—into the Quandl platform.

"We started our [alternative data] journey with Analytics Hub, which had around 25 datasets, and the next step was to take some of those products and merge them into the Quandl platform, which has more than 350 different datasets. Tammer is a quant, he built Quandl to make it easier for quants to access alternative data, and this was a key part of its value proposition," says Sibbern.

For Quandl, the deal provides it with Nasdaq's institutional backing, which will help it to grow faster and expand beyond North America into other regions, with more data and richer functionality on the platform."We have already started this journey," Sibbern says. "Nasdaq's global salesforce is selling Quandl data to firms in Asia and Europe, and as we continue we will bring in more datasets from those regions. We will also team up with some of the listed companies that we have in the Nasdaq family and help them to distribute their data on the Quandl platform." wt

(L–R) Abraham Thomas, Tammer Kamel, Terry Wade and Bill Dague

> We look at many companies in a year, and Quandl was such an obvious acquisition for us because of its leadership in the alternative data space.
>
> Bjørn Sibbern, Nasdaq

Best New Data Product

NovaSparks Data Compression

The Best New Data Product award, as voted by *WatersTechnology* readers, goes to NovaSparks for its optimized output functionality, which allows its NovaTick ticker plant to conflate data for transmission over microwave networks. This means firms can transmit and receive more data while minimizing latency peaks during high bursts of traffic.

NovaSparks developed the conflation feature in response to demand from clients using microwave networks to distribute normalized data from NovaTick to other datacenters. Market data distribution over microwave networks is an expensive yet critical part of any ultra-low latency trading infrastructure, but transmitting data updates is notoriously challenging because of their inherently low-bandwidth capacity.

By using patent-pending bandwidth shaping and market data conflation mechanisms, NovaTick is able to adapt its output data rate to conform to the microwave networks' strict bandwidth requirements. For banks and trading firms with NovaSparks deployment, this means the most recent market data updates can be transmitted via their existing microwave networks, while large latency peaks that would otherwise occur during market bursts are eliminated.

The functionality has been welcomed by trading firms, which typically have to be selective about the markets and the instruments from these markets to transmit, says Cliff Maddox, director of business development and marketing at NovaSparks. "The advantage of our conflation functionality is that it offers better utilization of the bandwidth on their network, so firms can effectively transmit more data."

Available for all 60 feeds of the NovaTick catalogue, including the major equity and futures and options venues across North America, Europe and Asia, the interface is an additional output option for clients, along with the 10 Gigabit Ethernet, PCI Express direct memory access and NovaLink options.

The functionality adds about 50 nanoseconds of processing time compared with the 10 Gigabit Ethernet output option, with no additional decoding required on the customer site, keeping wire-to-wire latency below 600 nanoseconds. Additionally, it is performed in pure hardware in the same processing pipeline as the feed handler and book-building, which eliminates all software/CPU processing.

Over the past year, NovaSparks has made enhancements to the functionality, including a new message format specifically for microwave networks, which is half the size of a standard message, Maddox says.

He adds that an advantage of using NovaSparks is its time-to-market. "A firm can go out there and buy bandwidth and pay tens of thousands of dollars a month for it. By taking our optimized solution, they can get into production very quickly and cost-effectively." wt

> The advantage of our conflation functionality is that it offers better utilization of the bandwidth on their network, so firms can effectively transmit more data.
>
> Cliff Maddox, NovaSparks

Contract Win of the Year

Crux Informatics

While the ability to ingest, clean and structure datasets has traditionally been an activity for financial companies, there is growing interest among market participants to offload tasks that provide limited differentiating value so they can devote more time on higher-value tasks such as interpreting and analyzing data. This year's Contract Win of the Year, as voted by readers, is awarded to Crux Informatics, which supports various financial companies, including systematic investment manager Two Sigma, to do just this.

Founded in 2017, Crux Informatics is solving data headaches for financial companies looking to offload the commoditized portions of their data delivery and operations. The company is run by Philip Brittan, who previously led product development for Thomson Reuters' financial and risk division, and was global business manager for foreign exchange at Bloomberg.

In September 2018, Crux Informatics announced it was supporting Two Sigma in performing critical processes to extract, validate and load data. "The benefit for Two Sigma—as it is for all of our clients—is that they are able to offload time-consuming and frustrating data ingestion work to us so they can free up resources to focus on the more esoteric tasks of finding alpha and extracting insights from the data," says Brittan. "We do the non-controversial work of wiring up, downloading, and checking and storing the data in a consistent way. We have operators who watch the feeds and call a vendor if the data is late or if the feed goes down; we take care of all those standard operations on behalf of every client."

As part of the partnership, Two Sigma made a minority equity investment in Crux Informatics, joining Goldman Sachs' Principal Strategic Investment Group and Citi, two of Crux Informatics' other investors. Brittan says the $20 million Series B funding will allow Crux Informatics to hire more engineers, developers and sales staff to enhance its platform and build a scalable operation quickly and efficiently.

"Two Sigma saw value in our managed service and became a customer, and they also shared our vision for the industry as a whole—for Crux to be a utility that can do this work on behalf of multiple customers, bringing economies of scale and best-of-breed practices—which is why they became an investor as well," Brittan says.

Crux Informatics has so far raised $41 million in funding over three rounds. Goldman Sachs invested $10 million in November 2017, and Citi invested $11 million four months later. wt

Max Bowie (L) and Philip Brittan

> The benefit for Two Sigma ... is that they are able to offload time-consuming and frustrating data ingestion work to us so they can free up resources to focus on the more esoteric tasks of finding alpha and extracting insights from the data.
>
> Philip Brittan, Crux Informatics

Best Enterprise Data Management Vendor

IHS Markit

An effective data management system is crucial to the operations of financial firms as it sits at the heart of every key business function. IHS Markit has positioned itself as the dominant player in this space by consistently evolving its enterprise data management (EDM) platform, and wins Best Enterprise Data Management Vendor for a second consecutive year.

At its core, EDM pulls disparate data types from multiple sources into a central hub and validates, masters, transforms and distributes the content for clients' key business operations. "We are a business user-driven platform, so we put the data management capabilities in the hands of the users. Typically in this space, EDM systems are a technical offering and we've differentiated ourselves by being able to do complex workflows in a usable way," says Andrew Eisen, global head of EDM at IHS Markit.

More than 200 buy- and sell-side clients use EDM, and it continues to grow its footprint, adding 23 clients last year alone. According to the company, data management use cases have expanded from core reference data into account, position, product, legal entity, transaction and regulatory datasets. As use cases expand, the company too has grown its remit from core data management to data warehousing, data delivery and data governance.

On the buy side, the ever-changing reporting landscape continues to drive demand for its data warehousing capabilities, while on the sell side the business is seeing a continued focus on data optimization. Recently added visualization tools help clients view and analyze their data consumption.

EDM can also be deployed via IHS Markit's managed services, available on the Amazon Web Services cloud. Between 40% and 60% of new clients start with a cloud implementation, Eisen says, and the company is seeing an increase in interest from clients who have traditional enterprise software deployments to migrate to the cloud.

One of the major developments for the business over the past year has been applying EDM to other verticals, starting with energy. Already, the company has onboarded 15 customers within the energy space. Expanding EDM to manage non-financial data offers the potential to bring IHS's proprietary datasets in other industries to EDM financial services clients. For instance, geo-spatial datasets, which provide details on oil well production, the location of wells and their depth, could also be of interest to EDM's financial services clients who use alternative data to support their investment decisions.

"We are looking to expand into other verticals in which IHS Markit has deep client relationships and industry understanding, such as the automotive, aerospace and maritime and trade industries, where operational data quality remains a challenge," says Eisen. wt

David Glover (L) and Matt Crabtree

> Typically in this space, EDM systems are a technical offering and we've differentiated ourselves by being able to do very complex workflows in a usable way.
>
> Andrew Eisen, IHS Markit

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Best Reference Data Provider

Bloomberg

After winning the award for Best Reference Data Provider in the *Waters* Rankings last year, Bloomberg continues its winning streak in this category.

Over the past year, the company has worked extensively to provide reference data that was previously only available on its terminal to clients through a data license. Some of the new content available to data license clients includes environmental, social and governance data on 11,500 companies, fundamentals data on 85,000 companies, data on more than 1 million supply-chain relationships, and two new classification schemes covering both entities and instruments, as well as new security ownership data. Consequently, the number of reference data fields available to data license clients has expanded from 13,000 a year ago to more than 40,000 today.

"Our reference data business is core to our enterprise data offering and offers us and our clients the building blocks to build a much deeper relationship," says Bradley Foster, global head of enterprise data content at Bloomberg.

Having those base layers of reference data is becoming increasingly important to our clients and is in part why we have made big investments in this area. Going from 13,000 to over 40,000 data fields clearly shows that we are serious about this business."

As part of those investments, Bloomberg has enhanced existing datasets, including corporate actions, where it has added data on complex events, mergers and acquisitions, divestitures and spin-offs. It has also expanded its futures and options data package, which provides reference, pricing and greeks data on listed derivatives. The package covers more product types, increasing the total number of contracts by 40%. It also offers more timely delivery, so customers can have their security masters ready before trading and seamlessly connect with more than 180 exchanges.

Bloomberg will continue to enhance these datasets, for instance by expanding fixed-income corporate actions coverage. In a more strategic sense, the real value to clients will be in showing how all the reference and other datasets link together—an area in which Bloomberg is spending a lot of time working with clients.

All of this work feeds into Bloomberg's "one data" proposition. "We want to be the one-data provider," says Foster. "This means we want to offer a more comprehensive and consistent data offering. We also want to offer more cost-effective and simplified distribution with data that is fast, reliable and easy to consume, and we want to offer clients data that's clean, tidy and ready to use, whether by human or machine. When we look at what we have done over the last year with our reference data business, it's easy to make this statement." wt

Paul Lankowicz (L) and Henry Yanbin Yang

> Our reference data business is core to our enterprise data offering and offers us and our clients the building blocks to build a much deeper relationship.
>
> Bradley Foster, Bloomberg

Inside Market Data & Inside Reference Data
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Best Evaluated Prices Service Provider

ICE Data Services

The growing complexity of investments and portfolio diversification, along with increasing regulatory demands and the continued focus on price transparency, means evaluated pricing has become a critical business requirement for financial firms.

ICE Data Services—which includes services from Interactive Data Corporation, acquired by Intercontinental Exchange in 2015—helps clients by providing independent evaluated pricing to front, middle and back offices. With its long-standing End-of-Day Evaluations and Continuous Evaluated Pricing, and other related services, the company tops the reader vote this year for Best Evaluated Prices Service Provider.

"Our Evaluated Pricing service originally started as an end-of-day offering, like many in this business, but in the last five years we have developed it into a near real-time offering," says Mark Heckert, head of pricing and analytics at ICE Data Services. "Since we have this golden record of pricing for fixed income—which is not a common asset—we've developed a number of analytical services on the back of that, which can help clients analyze liquidity in difficult-to-price areas of the market, measure best execution, value securities and understand risk."

The company calculates and publishes evaluations representing 145 countries and more than 50 different currencies for approximately 2.7 million fixed-income securities. "The sell side may use us in the price verification process or in the collateral management function. On the buy side, we might be an input to a net asset value for a mutual fund. We could also be used by a risk desk to assess their market risk or by an insurance firm to value their positions. We have a broad variety of clients," Heckert says.

What sets the company apart is its ability to marry human expertise and technology. Its approach combines both system and human analyses to generate a continuous stream of fixed-income evaluations that processes and incorporates market data throughout the day, which means clients are able to see an effective evaluation, even in confusing, volatile times, Heckert says.

Over the past year, the company has launched an offering that helps its customers address regulatory requirements for liquidity risk management, which involves funds providing greater transparency into their fixed-income investments, starting June 1. It also launched a yield curve offering earlier this year—the first of which is designed to provide transparency into the municipal bond market.

ICE Data Services will continue its strategy of supporting its customers' businesses holistically. Heckert says: "We want to make sure that we not only have a strong evaluation offering, but that we leverage our analytical offerings and our models to give clients the tools that provide broad transparency into fixed-income markets." wt

(L–R) Mark Heckert, Chris Krupa, Al Batten, Liz Abela and Jon Parisi

> We want to make sure that we not only have a strong evaluation offering, but that we leverage our analytical offerings and our models to give clients the tools that provide broad transparency into fixed-income markets.
>
> Mark Heckert, ICE Data Services

Trade Finance: A Whole New World

As global banks seek to promote trade finance as an investable asset class to the buy side, the sector's lack of technology and data infrastructure—as well as its inefficiencies—have come to light, reports Emilia David.

Banks have been the primary force behind trade finance for years. Trade finance is essential to the global economy and the sell side is now looking to turn this sector into an investable asset class—but it hasn't been smooth sailing.

If the asset class is to take off, a lot of work still needs to be done when it comes to deploying technology and building out the necessary data infrastructure—something akin to what's been seen in recent initiatives in the mortgage-backed securities field.

As an emerging asset class with some institutional interest, trade finance has been slow to take off due to a lack of standardization. As a result, it has been difficult to even create benchmarks that would allow the buy side to fully get involved. Naeem Khan, global head of trade finance at Crédit Agricole CIB, says technological changes to the sector will bring it more in line with other more traditional financial instruments.

"It's an opportunity and a challenge for a traditionally paper-based sector, so bringing technology into it and digitizing it is positive. Once it has been digitized, it brings cost efficiencies and we can serve clients more efficiently," Khan says. "I believe that in a few years, trade finance will grow in status and be seen as a truly investable asset class in its own right, to the extent that it is a viable alternative to equities and bonds. Various studies have shown that it is a lower risk proposition and is intrinsically tied to growth in the global economy."

High Interest, High Confusion

Trade finance usually refers to financing—either by loan or a bond—secured by businesses in order to ship goods. Global trade highly depends on trade financing as it can get very expensive for small to medium enterprises to move their products or raw materials to their customers across oceans or via rail. Although it has been around for centuries, trade finance is not traditionally traded as a security. But it's an attractive space because of its short tenor and low default rate, though it's also a wildly inefficient sector.

Like the mortgage sector before it—which is also highly paper-reliant—banks and the buy side saw potential in creat-

"[Trade finance] needs the right technology, which can provide greater transparency on the underlying assets at the line-item level so investors can conduct effective accounting and reporting that is compliant with regulations like Basel IV. Technology itself can play a bigger role because it can digitize the underlying instruments. This means trading is much easier than bilateral, one-to-one negotiations."
Francesco Filia, Fasanara Capital

ing an asset class based on trade finance. And as more companies learn about how this space can be made investable, greater attention can be paid to the infrastructure around it.

A report from Greenwich Associates and the EFA Group, *Trade Finance: A Promising New Asset Class for Institutional Investors*, notes that possible roadblocks to the investment vehicle include its lack of credit ratings, illiquidity and limited regulatory compliance measures. Unlike other asset classes, trade finance relies mainly on paper documents such as bills of lading, payment invoices, and letters of credit. Some countries actually require paper documents before a shipment can be accepted by customs. Naturally, it's hard to analyze multiple trades without the help of an electronic document. This opaqueness makes it difficult to get a clear idea of what is involved in a trade-financed contract, and therefore hard to price.

Power in Numbers

As global trade grows, firms are facing a large financing gap. The Asian Development Bank estimates a gap of $1.5 trillion in financing that must be filled to keep global trade growing. Trade around the world, according to the World Trade Organization (WTO), reached $5.3 trillion in 2017.

While it's true that the WTO expects a 2.6% drop in global trade in 2019 due to increasing trade tensions and economic uncertainty, it also predicts that global trade will rebound in 2020, which could lead to the financing gap increasing.

In light of this, banks including HSBC, ANZ, Deutsche Bank, Sumitomo Mitsui, Standard Chartered, Standard Bank, Crédit Agricole CIB, ING, Rabobank, and Lloyds started the Trade Finance Distribution (TFD) Initiative with the aim of promoting the use of trade finance as an asset class. Part of the initiative's mandate is to standardize definitions in the industry and create a more digital environment for trade finance.

The TFD Initiative works with TradeTeq as its technology partner and also counts among its members multilateral groups like the International Chamber of Commerce.

Damian Kwok, head of trade portfolio management at ANZ Bank, says the big challenge for the initiative is assuring potential investors the asset class is sustainable, accessible and transparent.

"There are a couple of key things we're working on, one of which is how to use technology to improve the process. Trade finance has typically been a difficult asset for investors to access, as the underlying assets can be quite small, high-volume and the tenor of the instrument can sometimes be very short dated—as little as 90 days or 180 days," says Kwok, who also oversees trade and supply-chain for Australia, New Zealand and the Pacific at the bank. "The challenge therefore is to reassure [the investors] that the asset is going to be replenished, so that they can be locked into the yield that they require in a portfolio or investment horizon. [Banks need to know] how to demonstrate the ability to provide a portfolio of assets with the risk appetite aligned against desirable yield expectations."

Kwok says technology can transform the whole trade finance process, but due to the global nature of the space, there are a lot of moving parts that need to be addressed. Banks like ANZ will need to figure out how digitization efforts inside their own four walls can help to improve processes and bring transparency. After all, while banks have looked to embrace digitization projects, they are not as easy as pressing a button and having these complex documents turned into machine-readable outputs.

Paper Problems

As noted previously, one of most persistent issues in trade and trade finance is its adherence to paper-based documentation. Because of the amount of paperwork involved, it can be difficult to truly gain insight into each underlying asset in a trade-financed security.

Asset managers interested in doing more business around the trade finance asset class are eagerly awaiting any technology that can ease a lot of the inefficiencies in the industry and make it more accessible without the need for a bilateral negotiation with a bank.

Francesco Filia, CEO and chief investment officer at Fasanara Capital, a London-based fund managing about $500 million in assets, says transparency into the market is even more important because the buy side must adhere to strict compliance rules. Any technology built for the asset class must allow companies to report to regulatory bodies.

"[Trade finance] needs the right technology, which can provide greater transparency on the underlying assets at the line-item level so investors can conduct effective accounting and reporting that is compliant with regulations like Basel IV," says Filia. "Technology itself can play a bigger role because it can digitize the underlying instruments.

This means trading is much easier than bilateral, one-to-one negotiations."

Fasanara has also joined the TFD Initiative. Filia says something like machine learning can do a better job of asset location using data analysis to help investors assess risk. Filia says this "has not been done to the full extent by banks because they base their activities more on relationships and have devoted more attention to the top end of the industry."

But not all asset managers think the trade finance asset class will be transparent enough so that information around all trades can be readily available. The lack of standardization of forms and terms can make it hard to conduct like-for-like comparisons. The asset class is also not actively traded, so it is difficult to compare to other deals—there's a dearth of information. This means benchmarking prices for securitized assets is a difficult undertaking.

Andy Sweeney, head of capital markets at asset manager Blackstar Capital, says it is highly unlikely the trade finance asset class will have market data readily available on a Bloomberg Terminal, or something similar.

Damian Kwok
ANZ

"There are different types of trade finance transactions, many of them highly esoteric. This makes it incredibly hard to have detailed and comparable datasets. It's also very document-heavy and requires a high level of specialization and lots of manual labor to parse those documents," Sweeney says.

But Sweeney says digitization would help the trade finance asset class grow as the number of documents that must be processed is very high—that's the first step. He says it is labor-intensive and time-consuming to onboard customers around trade finance, which means some organizations "avoid transactions that are less than $30 million since there is simply not much profit for them."

ANZ's Kwok, however, points out that banks are pushing for greater standardization especially because of the variables found in trade finance. He says putting standardized terms and processes first will make the development of a technology and data infrastructure much easier.

"The challenge is that trade is a global business—you have banks from Australia, North America, South America, Europe and elsewhere serving their local regions. These banks face different regulations, and have different processes internally," Kwok says. "The challenge for an investor is that if they go to a trade finance bank, how do they know that the underlying documentation is going to be the same as another given the different regimes?"

Another challenge is getting developing countries to accept digitized documents. Crédit Agricole's Khan says that while many developed countries can readily onboard platforms like the one TradeTeq is building, emerging countries generally do not trust digital documents. He says the power of a technology infrastructure for trade finance relies on having all parties using the same types of documents and providing access to the asset class for all interested.

Enter the Vendors

There are efforts underway, though, to help alleviate some of these challenges. London-based software company TradeTeq is working to build a platform for this nascent market. The platform will incorporate machine learning algorithms to help make connections from a sea of documentation. TradeTeq CEO Christoph Gugelmann—who

> "There are different types of trade finance transactions, many of them highly esoteric. This makes it incredibly hard to have detailed and comparable datasets. It's also very document-heavy and requires a high level of specialization and lots of manual labor to parse those documents."
> **Andy Sweeney, Blackstar Capital**

was previously at Goldman Sachs for about 12 years, Morgan Stanley for two years and Bank of America for three years—says the platform will aim to make trade finance more appealing by using automation and algorithms to reduce risk and add much-needed transparency and clarity in a paper-driven world.

"We are proposing a solution that is live and ready for production today. You need computing power, cloud computing and digitization, which really opens up new channels and creates trust. Looking ahead, we may work with other technology providers where we become a node on a blockchain or just an API—we remain agnostic," he says. "We have a buyer–supplier relationship and there's a critical need for an investor to assess all associated risks, including risk related to credit, fraud and dilution. Our machine-learning technology offers the transparency that investors need to measure the trading and credit risks associated with buyers and suppliers."

He adds the company currently has several proofs of concept ongoing with banks using its live client data.

Financial institutions interested in the asset class make do with the technology they have. When banks and some asset managers want to trade the asset class, they do it through bespoke platforms or—more often—through voice-traded bilateral negotiations.

Companies like R3 and IBM are aiming to digitize trade finance and use blockchain technology to provide the infrastructure necessary to underpin the sector. While these are not specifically intended to forward trade finance as an asset class, the idea is to create an electronic record for loans, bills of lading, invoices and other paperwork. These projects aim to provide transparency and efficiency, issues that become important when promoting the asset class.

R3, through an initiative called Voltron, built an application on its Corda enterprise blockchain that provides a synchronized shared database of transactions that acts as a letter-of-credit application. R3 officials tell *Waters Technology* that its latest test with 50 banks and companies saw 96% of its participants accelerate documentary collection and reduce letter-of-credit transactions to 24 hours from five to 10 days. It flags errors and instead of requiring a phone call to correct discrepancies, it can immediately reconcile any differences.

Gugelmann says distributed ledger technology could be a boon for the trade finance space, and by extension, the asset class itself, but the technology just isn't ready yet for the needs of the industry.

"We are big believers in distributed-ledger technology; the industry has made huge strides forward, but we believe the technology still needs to be embedded and scaled across the industry before it is ready for full production," he says.

Logistics firm Maersk has also built its own system for tracking shipments across the world that involves digitized paperwork that details the contents of its ships. This is limited to goods shipped with the company, though it could be used as a blueprint for others to follow.

Christoph Gugelmann
TradeTeq

Baby Steps

Trade finance itself is ripe for innovation—those efforts will only help to improve it as an asset class.

Even if this never takes off, it's clear that trade finance needs to evolve. So, for now, the ultimate goal of banks and the buy side is to grow interest in trade finance by showing that it can be improved—interest will help with standardization efforts, which will be underpinned by digitization projects, which will help to push technology projects forward, which will help to build out this sector as a true marketplace.

But this is going to be a long process. The question is, though, if there's the institutional fortitude necessary to push these standardization and digitization efforts forward. wt

Alternative Standards

Alternative data holds great promise as a leading indicator of alpha. But in response to firms struggling with the data science aspects of integrating the data, various industry participants are pursuing new initiatives to make it more accessible, reports Max Bowie.

To a hammer, every challenge resembles a nail. And to an industry excited by the promise of nontraditional, "alternative" data, every new dataset represents an untapped source of alpha. But while it's easy to swing a hammer, exploiting the value hidden within alternative datasets can be hard work—made even harder by a lack of standards that could make alternative data more transparent and expedite the processes of onboarding and utilizing new datasets.

Specifically, at the same time as demand is growing among financial firms to be able to incorporate alternative data into their investment strategies, frustration is growing at the amount of effort required to identify, acquire, and integrate this data before it can even begin having a positive impact on trading.

"In every conversation I have with buy-side firms now, the issue is that they may have to wait until resources become available at the client firm to be able to run a test," which can waste precious time, thus negating any potential advantage as each new dataset faces inevitable alpha decay as more firms begin using it, says Bruce Fador, managing director of Fador Global Consulting, which works with new data companies on strategic positioning and their go-to-market strategy.

To address the issue and make it easier for firms to work with alternative data, at the end of last year, FISD, the Financial Information Services Division of the Software and Information Industry Association, created a working group specifically to create standards around alternative datasets that will make them easier for users to consume.

Buy Side Take the Wheel

The project was initiated by asset managers frustrated by the barriers to

adopting alternative datasets—specifically the process of finding, assessing, and incorporating certain datasets before they can even start using them.

"We're buyers of alternative datasets. Last year, we did an internal data hackathon, where we had to onboard a whole bunch of datasets within one week, and we realized there were some things vendors could do to make the process easier," says the chief data scientist of a large asset manager, who also was instrumental in kick-starting the project. "So I started talking to people at other investment management firms, and found that everyone was experiencing the same issues … and that [alternative data] vendors were complaining, too, because each client wanted them to prioritize different things."

In the first half of 2018, FISD's executive committee performed a review of industry activities, and found that engaging with alternative data was one of the key topics that members wanted the association to focus on.

"FISD has been aware that alternative data is becoming more important to member firms, so we held alternative data forums in New York and London, and during the cocktail hour following one of these events, a member mentioned that there is a need for alternative data standards, and that FISD might be best placed to develop these," says Tracey Shumpert, director of member services for FISD.

After holding its first conference call in December, the group has assembled a number of large buy-side firms and defined some high-level goals, with plans to have concrete standards in place and ready for use by year-end.

The working group will initially focus on two key areas that are bottlenecks to adoption and use of alternative data—technical issues and procurement issues—and has divided its efforts into two corresponding streams.

The technical stream has created a summary of the pain points surrounding alternative data that it wants to address, covering areas such as delivery mechanisms, file formats, and metadata, starting with the creation of a standardized vendor "tear sheet" that outlines the attributes of a dataset without consumers needing to pore over different 50-page PowerPoint presentations for each vendor. Meanwhile, the procurement stream focuses on legal and compliance issues, such as the creation of standardized trials and due diligence questionnaires, and is in the process of obtaining feedback from participants on early drafts of documentation to govern these issues.

> "Alternative data vendors are genuinely seeking guidance from the financial data community. Our members believe standards and best practices will have benefits for the entire industry."
> **Tom Davin, FISD**

The resulting standards definitions will be publicly available on the FISD.net website and on Github, and will contribute to broader enforcement of best practices and guidelines. For example, if a new vendor approaches a firm with a PowerPoint deck, the firm can direct the vendor to the standards, so it can resubmit the information in the standardized format, making it easier for the potential client to understand what they're signing up for, and to compare it in a like-for-like manner with offerings from other providers.

The tear sheet, which should be available shortly, before any other deliverables, would provide a clear description of the dataset and what it covers, as well as details such as how certain data elements are calculated, and how the provider addresses issues such as look-ahead bias, and whether the data is delivered via a CSV or a pipe-delineated file, or in a format that might be hard for firms to import into their databases.

Tracey Shumpert
FISD

Transparency and Accountability

Fador says it's important that any descriptive standards are transparent about what a dataset is and does, and what's required to put it to use. "Is it unique? Is it foundational data, or does it have to be correlated with something else? How will buyers utilize this? How can they deploy it?" he says.

These terms and requirements may be well understood by existing data players. But some of the current disparities arise because the producers of alternative data may have their origins in other industries, and not be familiar with how financial markets participants consume data.

"Alternative data vendors are genuinely seeking guidance from the financial data community," says FISD managing director Tom Davin. "Our members believe standards and best practices will have benefits for the entire industry."

Response to the working group has been overwhelmingly positive, with numerous other market participants wanting a seat at the table. While the working group will only be open to buy-side participants initially, it may expand in the future to incorporate other interested parties, such as sell-side firms and vendors.

"I think it's a wonderful thing. It's time that someone put a set of standards in place to force providers to present their information in a standardized way," says Erez Katz, CEO of analytics provider Lucena Research, which recently partnered with events data vendor Wall Street Horizon to create trading strategies that combine alternative data with Lucena's predictive analytics.

Introducing standards would help eliminate some of the hype around new alternative datasets, and force vendors to present their wares in a way that is easy to understand and to

> "I started talking to people at other investment management firms, and found that everyone was experiencing the same issues ... and that [alternative data] vendors were complaining, too, because each client wanted them to prioritize different things."
> **Asset Manager CDO**

demonstrate, Katz adds. "You hold an analyst accountable for the validity of their report … but there are no rules or accountability on the data side right now, so I think this would be a welcome change for the market as a whole."

The Marketplace Model

While FISD's standards should make it easier for alternative data providers to approach consumers directly, traditional data aggregators are also staking their claim to those customer relationships, by creating their own marketplaces of alternative data, standardized around their own existing data, and in some cases, with "sandbox" environments for testing the data before committing to it.

Rich Newman
FactSet

For example, FactSet Research Systems last year launched its Open:FactSet Marketplace of alternative data, and continues to add new datasets, most recently including retail spending data from Mastercard.

"The challenge of alternative data is that it is so new. We've probably talked to 600 potential data partners, and onboarded around 60," says Rich Newman, senior vice president and global head of content and technology solutions at FactSet, adding that the vendor provides additional details for every dataset on the Open:FactSet Marketplace, similar to those being proposed as standards by FISD, including descriptions and details of coverage, as well as historical data.

Newman says the vendor's decision to build Markteplace was driven by the very same factors driving FISD's efforts: "We saw firms were taking such a long time to integrate alternative datasets before they can even test or use it … that they didn't know if they could get it running fast enough to see if it has alpha or can minimize risk," he says.

Matthew Rawlings
Bloomberg

Matthew Rawlings, chief data officer for enterprise data at Bloomberg, says the vendor's own efforts to aggregate alternative datasets—and its recent move to make alternative data available via its Bloomberg Enterprise Access Point online data portal—were also driven by demand from buy-side and sell-side firms.

"From my experience on the investment side, by the time you identify, license, and onboard alternative data, your original investment idea would already have timed out," says Rawlings, who spent 20 years in senior technology roles at UBS, Standard Bank, JP Morgan, Barclays Global Investors, and Barings before joining the vendor in 2014. "Alternative data was suffering from the same fragmentation that reference data used to suffer from. Integrating all these alternative data sources together so that clients can get them all from one vendor reduces complexity and cost."

Before onboarding any new dataset, Bloomberg performs a thorough series of checks to define the data, and confirm that the provider has the legal right to collect and distribute it, as well as other assessments, such as whether the dataset itself is ethical—arguably pre-screening for some of the factors that FISD's proposed standards would make transparent to consumers.

A major advantage of sourcing alternative data via aggregators is that it is delivered alongside—and pre-integrated with—vendor data that is already widely used by end-user firms, and the aggregator has already done the hard work of identifying, quality checking, onboarding, and integrating new datasets. Or, as Deirdre Sullivan, market development advisor at outsourced sales agency USAM Group, puts it: "Buy-side firms don't want to hunt and cook their dinner—they just want it on their plate."

Making the data simpler to acquire also broadens the interest in alternative data and opens it up to firms that may not have had the time or resources to incorporate it into their strategies previously, Bloomberg's Rawlings adds. "For even the resource-rich hedge funds, this is a big efficiency gain," he says.

However, not everyone is thrilled about—as they see it—the major vendors controlling access to yet another dataset.

Standards-Bearers

"People are tired of being locked into closed solutions … and this could increase your exposure to them. I think this is better managed in a community-driven, dispersed framework, rather than centralized [among big vendors]," the chief data scientist says, adding that the industry-driven environment arguably fosters greater openness and collaboration among natural competitors than might be achieved under the auspices of a prominent vendor. "Initially, I was worried that people would be secretive about what they are doing … but FISD provides a neutral place where people in the industry can come together," he adds.

FactSet's Newman, though, echoes what Bloomberg's Rawlings was saying: They are not looking to create a chokepoint of alternative data and that this will help buy-side firms new to the alt data space to get up and running.

"Every client would probably say they would rather keep us out of it and do the integration themselves, if they could. ... But one of our values is the ability to look across datasets," he says. "There are early adopters of alternative data who have a deep understanding of the subject, but for the other 99%, there is still a lot of educating to do."

Certainly, historically, while vendors have pursued their own development strategies for interoperability, once a clear need for standards arises within a specific segment of the industry, the effort of defining, codifying, enforcing, and educating the industry at large about those standards has fallen to specialist industry communities and trade bodies, such as FIX Trading Community or the International Organization for Standardization that operate independent from any individual vendor's agenda. The key here is that any vendor can carry the data, but that its basics should be presented in the same, standardized manner, no matter where consumers source the data from.

"Bloomberg has supported standards for data when customers have asked us to in the past … and so if we were asked to support alternative data standards, we would look at it very closely," says Bloomberg's Rawlings.

In addition, the vendor invests a lot of time in ensuring that alternative data providers' offerings meet its own criteria for data quality, regardless of any official standards. "We coach and partner with data suppliers to make their data clean and complete, and to link it to other identifiers, datasets, and definitions. Bloomberg has a lot of experience in this area. We're an issuer of Legal Entity Identifiers (LEIs), and also have Bloomberg's Financial Instrument Global Identifier (FIGI) … and by being an organization that issues identifiers, we're able to help companies that manufacture alternative data," Rawlings adds.

> "Buy-side firms don't want to hunt and cook their dinner—they just want it on their plate."
> Deirdre Sullivan, USAM Group

How to Make an Entrance

Indeed, this is exactly how new vendors have been encouraged to standardize their offerings to date—either based on the specific requirements of potential customers, or by seeking advice from consultancies that help new entrants target clients in the financial markets.

Feargal O'Sullivan, CEO of USAM Group—which began life offering US-based sales resources to UK- and Europe-based companies looking to win US business without having to set up an office and hire dedicated employees—says he has seen a lot of companies approaching USAM to help solve this problem, and that those seeking to enter the financial markets for the first time often fall short on how they approach sales.

"They might be technically competent because they've built systems to capture the data themselves, and they may also use it themselves. But often, they don't understand how to sell data," O'Sullivan says. "The most important thing is licensing the data; the second-most important thing is the structure of it, and making it technically easy to use; and the third-most important thing is being able to present use cases to buyers—it really helps to have that when you go to market."

London-based market data consulting firm Cordatum Associates, which advises companies on go-to-market initiatives for new data products, has also seen demand from new entrants for advice on how to pitch to capital markets clients. Philip Winstone, director at Cordatum, concurs with O'Sullivan's focus on licensing, but emphasizes that even before that, would-be providers must have a clear and accurate understanding of the worth of their potential dataset.

"New entrants into the financial markets and new entrants into the information side of financial markets—even existing financial market participants, in the latter case—do not understand the value of the data they hold to this specific market," Winstone says. "It's one thing to get your licensing right, but if you do not truly understand the value of your assets, then you cannot ensure your commercial terms are maximized right through from product-creation strategies, to pricing strategies, to distribution strategies, to licensing strategies. And that's not just important for the creators of the data, but for their potential clients, too: If you do not know where your value lies, how can you expect procurers and/or distributors to maximize the benefits of having you as a supplier or partner?"

Erez Katz
Lucena Research

Bruce Fador
Fador Global Consulting

License to Kill?

But when it comes to licensing data, some sources sound a note of caution. According to one data licensing expert, who asked for anonymity in order to speak freely, broader standards may be required as the industry evolves and as privacy becomes an increasingly thorny issue.

"The big challenges in the long term for alt data providers are ensuring their customers have all the rights they need to use the data in the product … especially where the contributors are scraping the data without identifying and securing similar assurances from their sources—or aggregating data from individuals without getting the informed consent of these individuals," says the source. "I'd be a bit skeptical about whether a one-size-fits-all set of policies will suit all alt data providers and customers, operating in all regulatory environments."

Ultimately, standards help different participants to speak the same language, and to make informed decisions based on like-for-like comparisons.

The advantages are that everyone pursues the same deliverables, rather than investing in separate approaches designed to achieve the same thing. The disadvantages include the fact that strategic industry-wide standards can take longer to finalize than individual, tactical approaches, at a time when more and more datasets are hitting the market.

But in the long run, the industry should view standards as an opportunity to make it easier for all market participants—from consumers to vendors—to get more out of alternative data, faster. Failure to seize that opportunity will only make adoption harder and slower. wt

Spotlight on Artificial Intelligence

At this year's North American Financial Information Summit, held in Manhattan on May 21, executives from Brown Brothers Harriman, BNY Mellon and Zurich Insurance discussed how they are using various forms of artificial intelligence. By Rebecca Natale, Emilia David and Joanna Wright

Brown Brothers Harriman

New York-based financial firm Brown Brothers Harriman (BBH), which services more than $5 trillion in assets, is developing its own machine learning models to detect price anomalies and eliminate the manual processes involved in reconciliation, Michael McGovern, managing director and head of the firm's investor services fintech offering, said while speaking on a panel at the North American Financial Information Summit (NAFIS), held in Manhattan on May 21.

McGovern said machine learning serves as a big commercial opportunity for helping with manual processes and automation needs throughout the industry, and can better assist asset classes that aren't as well-served in terms of structured data standards. For example, the firm is using it for reconciliations.

BBH's trained and supervised model uses an enormous amount of client data and old-school statistics to "provide a signal and separate it from noise, and then deploy that as an input into a reconciliation process," he said.

As an example, machine learning helps bring efficiency to one of the products under BBH's Infomediary franchise, called InfoRecon, which makes use of a back-end reconciliation engine. In working with one client, the data coming in was ideal, according to McGovern: clean, properly governed, high quality. Yet, the match rate hovered around 91%. By using machine learning algorithms to better find and highlight breaks, that figure reached 98.4% by identifying additional unmatched items. The model was trained entirely over a single weekend.

"If you think about it, the difference between 91 and 100 is all the manual processing left in that particular process. With this one model, we've eliminated 90% of that," he said.

Discounting the labor involved in collecting a massive amount of data, McGovern said the line between opportunity and challenge is a little

bit blurred in terms of democratizing machine learning and integrating seamlessly across the industry. The key is to get the people equation right, first.

"Get the tools in front of the people that have the domain expertise and have analytic mindsets and expertise in a specific area—could be an asset class, could be an investment strategy, could be geography, could be some arcane form of risk," he said. "This is not my term, but I love it, so I plagiarized it: 'I think we need to create a generation of citizen data scientists, and enable the analysts we have in different parts of our business to utilize this tool set to generate the next set of insights.'"

BNY Mellon

BNY Mellon is banking on artificial intelligence, particularly machine learning, to make access to—and understanding of—its documents easier for its employees.

Roman Regelman, chief digital officer at BNY Mellon, said the project will bring in documents, be it legal contracts or trading agreements, to make it easier for staff to query all internal records and find keywords quickly.

"The totality of documents is impossible to make sense of without some help, so we want to look at the entire document lifecycle and tease out the terms important to it," said Regelman, who delivered the opening keynote at NAFIS. "It helps us to [take in] more information, faster and be more proactive if a contract is expiring."

The project first targeted contracts and other legal documents mainly used by the bank's lawyers, but will eventually be expanded to almost all documents used by the bank. Regelman said elements of the program were already in use by the bank when he arrived last year and he saw that it could help in other parts of the organization.

Regelman said the goal is to use this technology to pull out and understand key terms in all of the bank's documents so as to find the important features of agreements faster. The documents are stored in a data lake and then algorithms are deployed to find the key terms. Regelman said anyone in the organization who needs to query documents can use the search function—it's not limited to the bank's legal team.

"We have about 1.1 million contracts; the oldest one still in force was enacted in 1920. So you can imagine it was not originally recorded in a digital format. These contracts have loads of terms that we need to abide by and our clients also need to follow," Regelman said. "So we deployed AI that goes through this entire database of contracts, which will skim for the key terms, and created this intelligence to empower the lawyers to understand terms better and enforce them."

Part of the move to digitize and run machine-learning algorithms on documents is BNY's commitment to augment work done by human employees. Regelman said melding artificial intelligence and human intelligence "can create amazing things, and if you do that right you can cut the cost. In some instances, you can cut costs by 50% and processing time by two-thirds."

> "We want to get into predictive analytics. Currently, we do reporting, but that is just the basics. Reporting solves accounting problems; it's mostly the hindsight that we get out of it. We want to get much more advanced in this area."
> **Ruchir Verma, Zurich Insurance**

Zurich Insurance

Zurich Insurance is trying out a data-as-a-service (DaaS) model, in conjunction with AIM Software, to be able to direct its energies toward high-level analytics and artificial intelligence, the insurer's Ruchir Verma said.

"We want to get into predictive analytics. Currently, we do reporting, but that is just the basics. Reporting solves accounting problems; it's mostly the hindsight that we get out of it. We want to get much more advanced in this area," said Verma, who is head of global services in the investment management business at Zurich.

Verma, who spoke at the event, hopes that the partnership with AIM Software will allow Zurich to reallocate resources from operations and change management to better experiment with advanced techniques like AI. He would also like to see a refocusing on the firm's core systems after years of throwing money at regulatory needs.

"Our resources are currently doing what AIM and third parties could do as part of DaaS. We would like to take [our] resources and focus them on areas where we think we have a competitive advantage, where we can bring in better results for the company, where we can be separate from our competitors. Competitive advantage starts when we put data in our core systems," he said.

Verma's part of the business invests a centralized pool of assets. Within that business is a unit called investment administration and accounting that has oversight over most of the investment accounting across the group and looks after all the back-office functions. The firm's data management, therefore, is within Verma's remit.

"All of the reference and pricing data that we use actually falls to my team. I have people sitting there and working on this data, making it useful, putting into downstream systems for accounting, reporting, risk systems—things like that," he said.

Zurich has been using AIM Software's GAIN product for these tasks for some years now. Currently, however, it's in the early stages of working with the provider to move all of the data from the investment management part of the business to their cloud environment.

Gayatri Raman, AIM's CEO, said her company started with Zurich's data operations, and is progressing from there.

"That is the natural entry point for a lot of our customers," she said. "But the way we are setting up the services is that we have data operations and data advisory kicking off in parallel. Once we take hold of the operations, people are going to come back and say, 'Well I need a data feed,' or, 'There is a new regulation coming, what are you going to do about it?' So we think advisory will have the most impact."

Verma said the two companies are working together to get the service running within the next few months. wt

Flying Blind

While buy-side firms are increasingly using machine learning technology to unearth information, Faye Kilburn learns that they have also limited their usage of deep learning techniques due to haziness of their inner workings.

In aviation, a black box is an on-board record of flight data that can be crucial in tracing the causes of an aircraft accident. The black box is, in reality, painted bright orange; it is designed to be found, opened and inspected.

By contrast, black boxes in the finance industry are opaque repositories of complex algorithms and coding that are tough to break open and study. With more widespread adoption of artificial intelligence, investment managers are starting to ask themselves whether these hard-to-interpret methods are a risk too far.

"When using a more transparent model, the parameters are clear. The assumptions being made about the relationship are clear. Neural networks have a lot more parameters to estimate, requiring a lot more data to get right," says Yaz Romahi, JP Morgan Asset Management's chief investment officer of quantitative beta strategies. "While their non-linearity is an advantage in terms of modeling, the lack of transparency means we don't actually know what the learned relationship is."

Recurrent neural networks are a type of artificial intelligence that JP Morgan AM uses to analyze the sentiment of phrases in analyst reports and other documents.

Rival asset manager Lazard will only employ machine learning—an application of artificial intelligence (AI)—if it can provide an ex-post justification for the algo in its investment strategy. NB Breton Hill uses machine learning for auxiliary functions such as data cleansing or financial report analysis,

but not for picking investments. Data Capital Management scraps three in five AI models over problems with interpretability.

The caution among these firms centers on the tension between the need for transparency and the desire for an investment edge. If a firm cannot explain to itself—let alone to clients—why a strategy is succeeding, then how can it replicate that performance in different market scenarios, or avoid a damaging blow-up? The question has implications for risk management as well as investment decision-making.

Jack Kim, chief risk officer at Data Management Capital, sums up black-box investing: "From the user's perspective, if something goes wrong, it is hard to determine how to fix the problem," he says.

In recent years, fundamental managers have begun to deploy artificial intelligence as part of a more disciplined data science-driven approach to investing, in tandem with existing quant tools like risk factors, rigorous statistical analysis and hordes of data.

Many firms have reported early success with simple interpretable machine learning techniques developed from regression, a core statistical discipline. An example is decision trees, which model the factors that contribute to a particular outcome via a series of branching operations.

For these methods, it is relatively straightforward to explain the model's output, because it is possible to retrace the steps the algorithm made and the data it considered to be important. But in an effort to get more predictive power, many firms have plunged into the murky realm of deep learning and neural networks, which attempt to mimic the complex decision-making networks of the human brain.

Deep learning is the powerhouse behind Apple and Amazon's respective voice recognition technologies, Siri and Alexa, and how self-driving cars recognize objects on the road. In asset management, its applications have been wide-ranging, from predicting stock price movements, to natural language processing of text data like news and social media, from image classification of satellite imagery to modeling risk. (*See Box.*)

The reason deep learning neural networks are so attractive to quants in finance is because they are especially good at finding complex or non-linear relationships that vary over time, economic cycle, or other conditions.

Quant fund Acadian Asset Management, with $96 billion in assets under management, believes non-linear forecasting is one of the biggest applications for deep learning in quant investing. In recent research, the firm argues it is wrong to assume that many of the widely accepted drivers of stock prices are linear.

Seth Weingram, the firm's director of client advisory, says: "Historically, people have tended to make simplifying assumptions about the relationships between corporate attributes and future returns, and historical stock price performance and future returns. But often those assumptions are there to help to simplify the problem in a computational way."

> "When using a more transparent model, the parameters are clear. The assumptions being made about the relationship are clear. Neural networks have a lot more parameters to estimate, requiring a lot more data to get right."
> **Yaz Romahi, JP Morgan Asset Management**

These simplifications often take the form of an assumption of a straight line between a given variable and future returns, but according to Weingram, there's little reason to believe that is what the relationship looks like.

"One of the things machine learning is useful for is to allow an algorithm to infer what the shape of relationship might be. Do we know that's a straight line relationship? Could it be curved? Could it depend on the environment we're in, or a particular time period and so on?" Weingram says.

Another area where deep learning could help unearth non-linear relationships is alternative data, which refers to new kinds of data not traditionally in investment managers' toolkit. Examples include patents, social media data, credit card company information, satellite imagery, geolocation data, and website scraping.

Kathryn Kaminski, chief research strategist and portfolio manager at Natixis-affiliated quant fund AlphaSimplex, describes an example of how rainfall affects corn prices. Too much rainfall hits crop yields, as does too little rainfall. The sweet spot is somewhere in the middle.

"Non-linear approaches are better at picking up some of these complex relationships," she says.

What are neural networks?

Neural networks consist of a system of neurons, which are individual processors, connected by flows of data. Each neuron takes input data and performs a non-linear transformation on that data. It then passes on that transformed data to the next column of neurons. A neuron gives a weight to each set of data being passed to it by a different neuron. These weights are calibrated according to the entire system's performance; neural connections that increase performance are given greater weight while those having less of an effect are given smaller weights.

> "If things are interacting in a very complex way that you don't understand, you don't have the comfort to risk-manage on a scenario-by-scenario basis."
> **Jack Kim, Data Management Capital**

But the limited dataset in finance, compared with other industries, raises problems. If a quant in the medical field were to build an AI algorithm to determine normal cells from cancer cells, it is possible to find patients from around the world—in other words, fresh datasets—to test the algorithm to see whether it's learned correctly.

"The problem with finance is we only have one instance of history, and if you've learned on that history, you don't have another way to cross-validate the learned behavior," says Romahi at JP Morgan AM. "So the only way to test it is to run it in real life, and that's risky."

Jack Kim
Data Management Capital

Paul Moghtader, in Lazard Asset Management's quant team, which manages $15 billion in assets, stresses the importance of data in justifying the use of AI algorithms.

"All our research projects have to start with an investment rationale. Why should this work? Why should this make sense? And machine learning and deep learning, in some sense, starts with the opposite. It starts with, what does the data tell us? And so, understanding it after the fact is crucial," he says.

Moghtader adds that if the output of an AI algorithm doesn't have a clear investment rationale, "then we won't implement it."

Pick and Choose

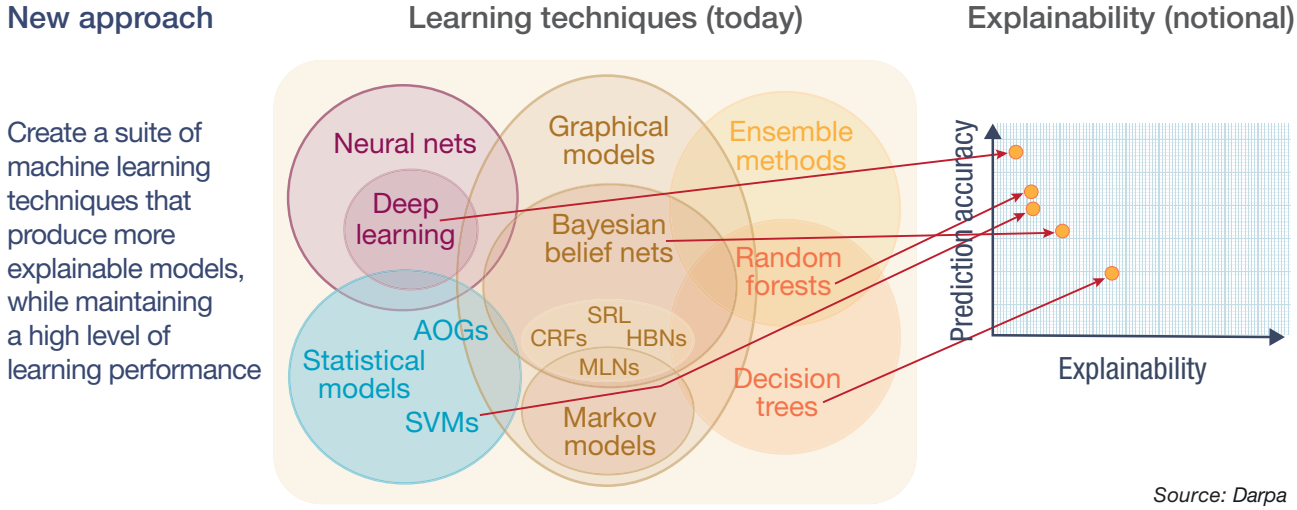
In the meantime, funds are getting smart about how to balance interpretability with performance.

Ray Carroll, chief investment officer of NB Breton Hill, Neuberger Berman's quant group, which manages $4 billion, believes the biggest risk is to depend wholly on opaque machines to generate trades.

"If I didn't enforce any human insight into the investment process, I'm pretty sure that a machine learning trading system would say 'buy on the dip' every time because when you calibrate it to the last decade, that's what would be successful. But that's a road to disaster if there's a recession. So, I am wary about handing over the keys to the machine," he says.

Instead, NB Breton Hill uses complex machine learning algorithms in non-critical scenarios, such as filling in missing data, or updating stale data. For example, Carroll says, prior to a company releasing its full financial report, it will sometimes issue a press release with partial financial information. The firm uses AI to analyze information from the compa-

Explainable AI: Performance vs. Explainability



Source: Darpa

ny's peers that have already reported, and make updated estimates of the financials.

Carroll says he is more comfortable using complex algorithms if it is possible to clearly understand what the output is—for example, natural-language processing of earnings calls transcripts. The firm has developed a widget that displays a transcript of the call, highlighting words or phrases that the machine interprets as bullish in green, and bearish in red.

Acadian Asset Management leans toward transparency when it needs to understand the most important predictors of returns. The fund is exploring how different indicators of the financial strength of corporations can be used to predict future returns.

"It could be that there are non-linear relationships between those attributes and future returns, which is one motivation for machine learning. On top of that, certain machine learning algorithms pick out what the most important predictors are. So we choose the algorithm that had the most transparency," Weingram says.

"There is a conventional wisdom that with machine learning, you're automatically turning out the lights. But it doesn't have to be the case," he adds.

According to Data Capital Management's Kim, several schools of thought are emerging as to how asset managers should approach explainability.

One is that quants should only use interpretable machine learning algorithms, which limits the scope to very simple, generalized linear models. Another is that they should stick to models such as gradient boosting trees and random forests, which have naturally embedded methods of tracking back what were the important features in the overall decision-making process. Both techniques use decision trees, but they differ in how the results are combined. Gradient boosting trees are built sequentially, with every new tree constructed to correct errors made by previously trained trees. In random forests, each tree is trained independently using a random sample of the data.

For Kim, interpretable artificial intelligence is one of the systematic hedge fund's "main concentrations." It explains why the firm dumps three in every five of the models it develops.

BlackRock acted similarly last year when it decided to mothball liquidity risk models built using neural networks, even though they outperformed decision tree-based models,

Kathryn Kaminski
AlphaSimplex

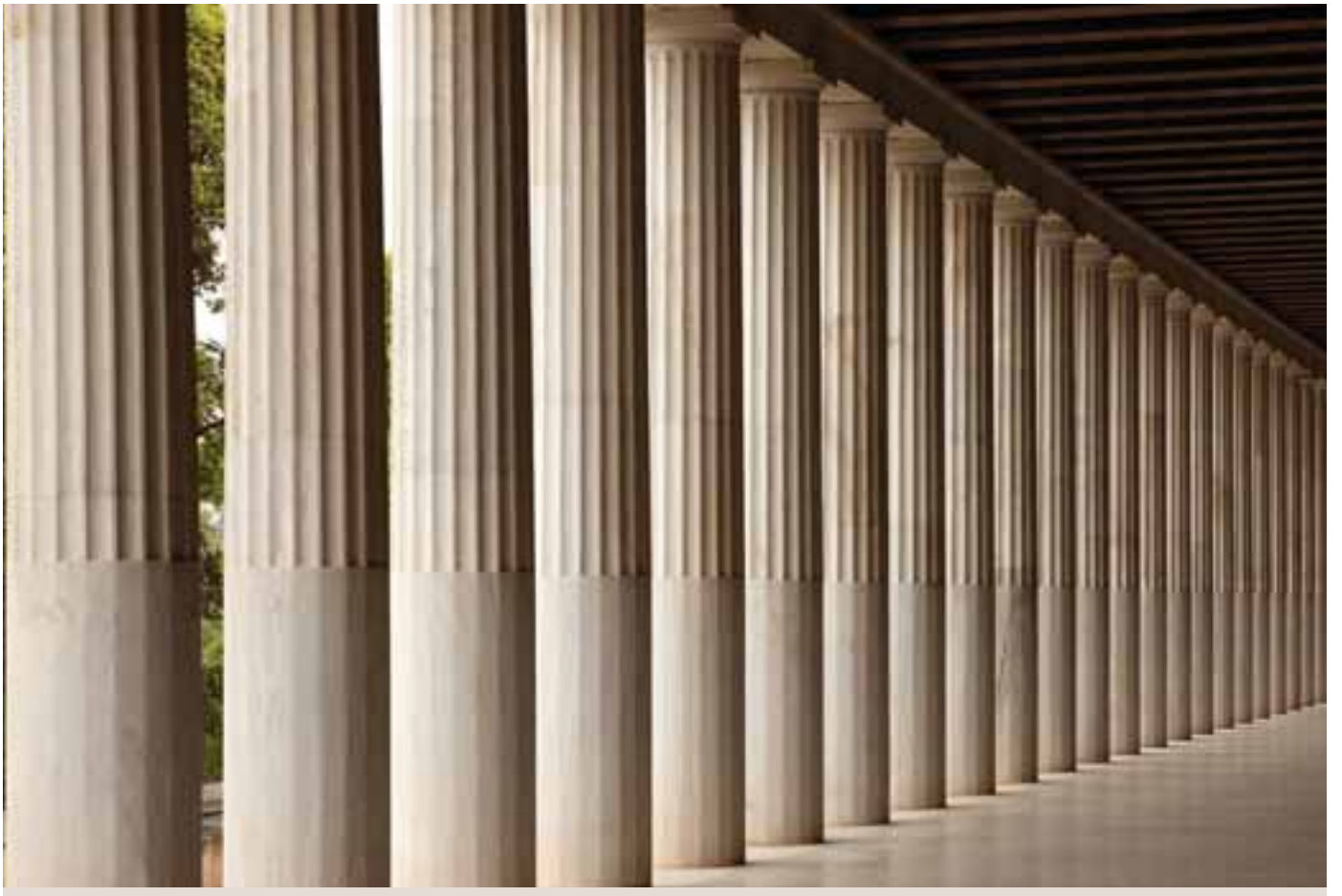
because they weren't explainable. Other firms, too, are questioning whether the use of non-linear AI can leave them exposed to shadowy risks that are hard, if not impossible, to manage.

"If you have net long US equity factor exposure with linear portfolio construction, and there is an expected major market or geopolitical move, and if you don't want to take that risk, you can reduce or eliminate your exposure to that particular factor, de-risk or hedge your positions," Kim says. "But if things are interacting in a very complex way that you don't understand, you don't have the comfort to risk-manage on a scenario-by-scenario basis."

Kaminski, too, cautions that it can become very hard to predict how non-linear signals combine together and to determine how much risk is being taken. "If you have a very complicated neural network, it's very hard to know that you're not doubling up on the same features for different markets. It becomes complicated fast," Kaminski says.

As complex machine learning permeates the investment management industry, firms are quickly realizing the dangers of getting lost in the random forest. wt

A Little Bit of History Repeating



Stock selection may seem like an easy tick-off-the-list thing to do. However, with new entrants encroaching on existing brick-and-mortar territory, and perhaps a few more in terms of business lines, this might make the process a little more complicated. Wei-Shen Wong finds out if the traditional classification for stocks needs to change and why.

In the 1880s, the core businesses that would eventually become IBM were created. Big Blue has since become a major technology provider in a multitude of spaces, from personal computers to floppy disks to servers to quantum computers. For investment purposes, the vast and complex company is lumped into the same category as Alphabet, the owner of Google. While these companies do overlap—especially in the cloud space—their business structures differ greatly.

It would seem that stock classification should be an easy task, but technological advancements have made it easier for companies to expand into new and diverse markets. As a result, buy-side firms are increasingly finding it difficult to compare fintech companies on a like-for-like basis. Part of the problem rests in having clean and accurate data to conduct back-testing and portfolio optimization techniques, says Danny Wong, chief executive of Areca Capital, a Malaysia-based asset manager.

"The limitation is not because of the timing, be it 10 or 20 years," he says. "To us, it's just that we can't find similar characteristics of certain businesses, and looking beyond 10 years it's even worse. For example, I can't find Alibaba or Tencent-type stocks. In today's dynamic business world, there are certain businesses that are very new. I don't think there was a biometric-like sector 20 years ago. So it's very hard to use a long history [of data] to chart the future. It's hard to do optimization or even rebalancing in this case."

For a small firm like Areca, it can be a time-consuming process to properly classify companies. Wong adds that he's still figuring out how to evaluate fintech stocks, especially those that are newer to the market with less data available or those that are a hybrid—a mix between traditional and more tech-centric companies.

To help solve for some of these issues, firms are increasingly turning to natural-language processing (NLP) to help bring clarity where lines may be blurred.

> "You can still use the data and the models to infer about potential outcomes, but you have to be very clear about the calibration and probability level that might occur. For these types of companies, the probability that you can forecast what's going on is lower. As an investment manager or asset manager, you need to calibrate your understanding of what that means in terms of how much you should invest or how big your exposures should be, and that comes down to your risk management process."
> **Joel Coverdale, Axioma**

Changing Classifications

Mike Chen, a portfolio manager at PanAgora Asset Management, which manages about $46 billion in assets, says there are two issues with the traditional classification scheme.

"First of all, it's backward-looking and they rarely get updated, or even if they do, that happens between very long timelines. Secondly, it's really based on human judgment and based on the community," he says. "So for example, Netflix was classified as consumer discretionary, same as Disney, because it's so-called entertainment, right? Until 2018, that has been the situation [and] that was a very inaccurate classification. If you think about Netflix's business, it's nothing like Disney. For example, Yum! Brands, the owner of KFC, is also in the same sector. So you have wider classifications, but in general, this is a big issue because this is very inaccurate."

Last year, S&P Dow Jones Indices and MSCI overhauled their telecommunications services sector and moved stocks like Alphabet, Facebook, Netflix and Disney into the rebranded communications sector from the tech and consumer discretionary sector. But Chen says PanAgora has taken a different approach. It researches how the management of a company describes themselves through publicly available documents, such as security filings, conference calls, and transcripts, among others. What it looks for is information that shows management discussing who their competitors are and what sector they are in, what kind of business lines they have, and where they are hiring people from.

"We feed this information to natural-language processing and use how management describes themselves to see how we could classify the company. We use neural-net-based natural-language processing to do this," Chen says. "There are a nice variety of classification algorithms that you can use to group companies together. So actually using this technique, we were able to group these companies much more accurately. So Netflix would certainly be grouped with the likes of Google and Facebook because they have similar lines of business, they hire very similar talent, and so on and so forth."

PanAgora also measures "soft" classification instead of a "hard" classification, which is putting a company into one given sector or industry.

"Say 50% of the exposure of this company is in sector 'A' and 25% is in sector 'B' and the rest is in sector 'C.' This is what we call soft clustering—you can measure all the different lines of businesses that a company is in and also the proportion of exposure it has. So we have this technology that we research and develop to generate alpha factors or alpha insight scores," he adds.

Modeled to Perfection ... or Not

As the traditional classification scheme is starting to change, one might ask how that then impacts back-testing or stress-testing methodologies, if at all.

There are different ways to run a stress test, explains Joel Coverdale, managing director for Asia-Pacific at risk management solution vendor Axioma.

"One way would be to take the stock of the company that you're interested in and see how it performed 20 years ago. If it existed 20 years ago then you can just use the information from the company to do that analysis. Clearly, that has a huge issue, which is that if a company changes the nature of its revenue streams or business, then it's unlikely the behavior 20 years ago will be relevant today. The second thing is for companies that didn't exist 20 years ago, you clearly can't do that because there is no history," he says.

Rather than using the return profile of the company, or historical data, another way to conduct a stress test is to look at the different set of risk exposures.

Coverdale explains that Axioma's risk model decomposes a stock into fundamental exposures driven by the nature of the business. "This could be by industry, the size of the company, whether or not it is a value or growth company—fundamental characteristics like that help you define the company. So what you can actually do is think of the company, not as a single return series but as a composition of a number of different exposures. Rather than think about Tencent as just Tencent, you can think about Tencent as a large Chinese financial technology company that on a book-to-price basis is quite expensive that has had momentum in terms of price performance, for example," he says.

Breaking exposures into factors, an asset manager can look back at history and compare how they performed, rather than comparing a certain return profile or characteristic of an individual stock.

> "Netflix was classified as consumer discretionary, same as Disney, because it's so-called entertainment right? Until 2018, that has been the situation [and] that was a very inaccurate classification."
> **Mike Chen, PanAgora Asset Management**

"Using the exposures, you can solve the problem by saying the nature of Tencent is the following. ... And because I know that information, those risk characteristics have existed in the past and we have the return series for that characterization. I can then break down Tencent into a set of exposures and then in the stress test I can see how those factors perform through the global financial crisis, or how those factors performed during the Asian financial crisis. And if I know the relationship between those factors and the company, then I've identified today that Tencent is a large financial technology company. I know what industry it's in, I know the size, and then I can make some assumption that this will be its likely performance," he says.

Like most quant managers, PanAgora uses off-the-shelf commercial risk packages from large providers. Chen

says that it does look at traditional factors like value, quality, momentum and size.

It can be hard, though, as traditional risk models are tailored to individual companies, which Chen says can be inaccurate as it is backward-looking. He says sectoring or grouping could be a better way to do that.

"We came up with a way to do it, but that's just one method," he says. "Facebook, for example, has very different risk measures using Barra or any other risk model when compared to IBM. But I think people just group them up together."

Even though commercial vendors have risk models that have different risk exposures for different companies, at the end of the day, how those models are used is up to the user. PanAgora prefers to use traditional alpha factors and then add alternative alpha factors from, say, social media using web-scraping techniques to build an alpha model.

That means that for each stock, PanAgora needs to figure out what factors explain the stock's performance. "Think of it as the stock's key performance indicator. What this means is that for different stocks with a different setup, the alpha factors would matter more than others. So this means momentum and growth for smaller companies will matter more than value and quality for larger and more stable and older companies right? So then because the risk modeling for that is available already for these listed companies, even though they're very new, we can incorporate other alpha factors into the alpha model for these companies," he adds.

Coverdale cautions that the biggest challenge is that no model is perfect. He explains that—particularly with new stocks, because there is less information available—there is more uncertainty around what could happen.

"You can still use the data and the models to infer about potential outcomes, but you have to be very clear about the calibration and probability level that might occur. For these types of companies, the probability that you can forecast what's going on is lower. As an investment manager or asset manager, you need to calibrate your understanding of what that means in terms of how much you should invest or how big your exposures should be, and that comes down to your risk management process. How big is your risk management process, and how do you manage the uncertainty on the many different dimensions in your portfolio because ultimately, no model is perfect," says Coverdale.

> "Sometimes technical or data-driven analysis is part of the allocation strategy, but not the full optimization process. We need to remember that investment is not just a science, it is also an art."
> **Danny Wong, Areca Capital**

History Rhymes

For an extreme event like the financial crisis, one might think that creating risk models and then stress testing their portfolios in that scenario would leave them totally unscathed when a similar event comes along, but that may be far from the truth. And it's important to keep that in mind when evaluating firms that have new and evolved business structures. Sometimes, gut feel is what separates winners and losers, though, like Texas Hold'em, the swings can be dizzying.

For Areca's Wong, a rough optimization that produces a ballpark figure is good enough. "Sometimes technical or data-driven analysis is part of the allocation strategy, but not the full optimization process. We need to remember that investment is not just a science, it is also an art. You've got to put in your gut feeling and use your experience. Sometimes you have to look at the direction of where things are going. No one can chart the future," he says.

Not only is technology evolving rapidly, it also means that actual businesses and entire business sectors are changing quickly, too. Classifying stocks will continue to be a challenge and buy-side firms will need to adjust their risk methodologies.

However, as much as firms try to prepare and arm themselves with reactions to potentially volatile market conditions, perhaps it is better to accept the fact that they will never be 100% ready for what is to come. Improvise, adapt and overcome. Or, better yet, a quote that often gets attributed to Mark Twain is something that every buy-side firm should remember: "History doesn't repeat itself, but it often rhymes." wt

Setting the Standard

As regulators and industry bodies ramp up efforts to deploy machine-readable models for derivatives reporting, Josephine Gallagher reports that the adoption of industry-wide standards has more than a few challenges to overcome—in derivatives and elsewhere. Maybe technology can help.

Investment firms have been banging heads over standardization problems for decades. Yet the recent efforts to establish a common model for derivatives trading is bringing to light the sheer scale of implementing industry-wide standards across all reported instruments in the future.

"To do this industry-wide, it would cost billions of dollars to implement and I don't think I can see it happening," says Matt Hampson, deputy chief digital officer at Nomura.

Nevertheless, the industry is trudging forward, and for the right reasons, even if the path is beset with challenges. The last year has seen the most progressive steps toward unified standards. On May 21, the International Swaps and Derivatives Association (Isda) announced the second iteration of its Common Domain Model (CDM 2.0) used to support financial institutions during phase-two testing of the digital regulatory reporting (DRR) for derivatives. DRR is a UK initiative headed up by the Financial Conduct Authority (FCA) and the Bank of England (BoE) to help firms comply with their regulatory obligations and improve the quality of reported data.

Ian Sloyan, director of market structure and technology at Isda, explains that every bank has its own way of implementing different regulations. Through working with UK regulators, Isda aims to provide a machine-readable representation of the derivatives lifecycle process that can be "transparently shared and centralized."

If successful, the initiative could set the precedent for an industry-wide model to follow for other asset classes and products. Yet achieving this would involve enormous internal efforts—requiring firms to rewire their trading systems and formalize every data element across their entire technology estates. While standardization efforts sound logical, they often turn into quagmires. *WatersTechnology* spoke with regulators, bank executives and lawyers to see where progress is being made, and where there's still work to be done.

While it's important for the organization to understand why these sometimes tedious and arduous data transformation efforts are necessary, at the end of the day,

it will be technology that will play a key role in this industry-wide evolution.

Brett Redfearn, director of the division of trading and markets at the US Securities and Exchange Commission (SEC), tells *WatersTechnology* that automation is set to play a significant role across the regulatory landscape going forward.

"The utilization of technology [for surveillance and regulation] continues to evolve and expand, and, indeed, there will continue to be greater investment and focus on the new and innovative ways of deploying technology," he says, giving a nod to developments in the machine-readable space.

But first, trading houses need to get their data right.

The Domino Effect

Following the financial crisis, global regulators implemented sweeping rules in a bid to provide transparency, reduce financial risk and prevent market abuse. There were the introductions of Dodd–Frank and Mifid II, and the European Markets Infrastructure Regulation (EMIR) was ratified.

None of this is new. But today, multiple regulations exist with very different, complex models and processes for reporting. EMIR, for example, has 129 data fields, and mandates counterparties to report to a trade repository, whereas under Mifid II—in some cases—firms are obliged to report to an Approved Publication Arrangement (APA).

To complicate things further, individual banks' regulatory systems operate differently and at the same time, banks are still struggling to cope with the challenges of legacy architectures and fragmented IT stacks. Within that, bulge-bracket firms work across multiple siloed trading desks—including derivatives, foreign exchange (FX) and interest rates—where traders interpret booking models differently.

Sources say there are different data consistencies at different institutions depending on booking models. While line trades are exactly the same, and the economics and the accounting are the same, some people might book them in different ways because of how those underlying technology applications and systems are configured.

> "The utilization of technology [for surveillance and regulation] continues to evolve and expand, and, indeed, there will continue to be greater investment and focus on the new and innovative ways of deploying technology."
> **Brett Redfearn, Securities and Exchange Commission**

Now, as firms are looking to simplify their internal business operations and drive down costs, they also have to guess which data models to opt for, as the industry waits to decide on a common taxonomy. According to Hampson, many of these challenges could have been avoided.

"What I think the industry should have done many years ago is at least settle on a standard, via these various regulatory feeds that we have been asked to produce [year after year]," he explains. "If the regulators had made that a requirement, the industry would have slowly edged there—but, unfortunately, it is a lost opportunity."

However, the derivatives space has garnered the most effort to achieve some level of standardization. In addition to Isda's development of a CDM, the International Organization of Securities Commissions (Iosco) and the Committee on Payments and Market Infrastructures (CPMI) have also produced guidance on harmonizing data elements for over-the-counter (OTC) derivatives, following a request from the Financial Stability Board in 2014. Existing standards include the use of unique transaction identifiers and legal entity identifiers, which are required to be submitted when reporting to a trade repository under EMIR.

Standardization promises many valuable benefits to the industry as a whole. But one in particular, involves forcing firms to clean up their data.

"In terms of data quality, it has been beneficial to the banks because this is work that would not get done otherwise," says a regulatory risk manager at a tier-one US bank.

Top Down

As the derivatives standardization efforts progress, it's also important to understand exactly how data transformation projects work inside the four walls of a bank with varied and complex business lines.

Data-cleansing exercises require extensive resources and funding to get off the ground. In many cases, it can involve "reprogramming" the minds of senior non-technology executives and forcing them to realize the benefit of large-scale investments.

As it was for many institutions, this was the case for Nomura. Currently, the Tokyo-headquartered investment bank is in the midst of a transitional period where it has just restructured its corporate leadership and is undergoing changes to its business processes, such as automating various middle-office functions. As part of a wider strategy, it aims to reduce operational overhead by consolidating its internal platforms and simplifying its IT stack—allowing it to then improve its data quality.

"One of the important things to understand is that data is a byproduct of business processes, which are a byproduct of organizational constructs," Hampson explains. "The mistake that people make is if you try to fix the [internal] data, but do not change the organizational constructs or the business processes, you will fail."

Similarly, the regulatory risk manager explains that getting the budget

to commission these projects can be challenging. The main drivers come down to two things: the business value—how the organization drives profits—or whether it's a regulatory obligation, and those have to get done.

"In terms of getting the budget and the go-ahead from senior management to do these kinds of data-cleaning exercises, you need to show that the regulator wants this," the regulatory risk manager says. "If it is on the business side, it is questioned in terms of whether it is worth doing it from a business point of view. When it comes to the risk [department], you are in the second line [of priority] and then more often than not, you still need a letter from the regulator or a requirement from the regulator to make your case for funding."

Matt Hampson
Nomura

Blockchain and Beyond

While the regulatory efforts undertaken in Europe, North America and Asia were necessary, as the financial crisis made clear, the rules put in place often do not overlap—and can even be at odds—when comparing one jurisdiction's laws to another. This has led to banks creating purpose-built solutions, which can be costly and don't help solve for the root data problems inside a bank.

So implementing data standards will help financial institutions to better comply with these complex new rules. And it should be noted that failure to comply with or accurately interpret rules leaves firms open to multi-million dollar fines. Take, for example, Goldman Sachs. The investment bank was recently hit with a $34.3 million fine for misreporting more than 220 transactions over a 10-year period.

One of the proposed solutions to the problem of misinterpretation—in which regulators have expressed interest—is distributed-ledger technology (DLT), which often gets used interchangeably with blockchain platforms, though blockchain is a form of DLT. The idea is that firms could store their transaction information or reporting data on a distributed ledger, and give regulators access to—and visibility of—the data through permission-based nodes, on a real-time basis, rather than through an end-of-batch view.

Ultimately, questions remain as to what shape or form these new platforms would take in facilitating market transparency and helping with the regulatory process. While there

are many proofs of concept, beta versions and small-batch live projects, some doubt DLT could handle entire markets.

The Depository Trust and Clearing Corp. (DTCC) has recently garnered attention for its blockchain-based project, where it is partnering with IBM, R3, and Axoni to restructure its Trade Information Warehouse (TIW), its primary processing center for credit derivatives trades. The project is expected to go live in the coming months and will require interoperability with platforms such as MarkitSERV's new TradeServ platform.

The Australian Securities Exchange (ASX) is replacing its Clearing House Electronic Subregister System (Chess), which serves as its equity clearing and settlement platform, with a blockchain platform developed by Digital Asset Holdings.

On the other hand, the New York Stock Exchange (NYSE) considered replacing its trading platform with a blockchain-based platform, but ultimately decided that it wouldn't be appropriate for an equities market the size of the NYSE's.

"Blockchain technology does not support the scale of processing and time of processing that you need in the equity markets if you're talking about matching trades," Stacey Cunningham, president of the NYSE, recently told *WatersTechnology*. "There might be some functions within the equity market that can consider leveraging components of blockchain technology, but if you're talking about the largest exchange in the world, blockchain is not ready to process that."

Michael Thomas
Hogan Lovells

Which Way Forward

The problem with blockchain is that it's not quite ready for primetime—yet. Regulators and financial institutions will likely need to make incremental changes because the markets are already complex and intertwined enough without adding new risks into the system. So regulators are focused on high standards for the data that is delivered, and the timeliness of reports handed over to the regulators, says Michael Thomas, partner at Hogan Lovells, a UK-based law firm.

"I think the challenge with any regulated technology that has been brought in to change the way in which the current market operations are structured is to ensure that it doesn't result in diminishing the standards, or result in the creation of new risks," Thomas says. So, as a result, the financial markets will have to move forward more cautiously than other industries.

The best thing financial services firms can do is better future-proof themselves for the world ahead, but that requires building a true data foundation. There will always be regulatory overhauls, and there will be subsequent periods of deregulation. New tools will continue to hit the market—while blockchain is the "latest-and-greatest," 5G networks and quantum computing are poised to completely change the way information is stored, shared and analyzed.

But if firms can start to get a better handle on their data today, it will make adjusting to new regulations and tools easier. That starts with data standardization and getting rid of the use of non-machine-readable documents and processes. It's about changing the culture of an organization and getting everyone involved—from senior managers to the middle and back offices—in understanding why these efforts are necessary for the long-term health of the organization.

This will not be an easy process but the derivatives sector may be the best place to make headway. Perhaps the best use-cases will come elsewhere. But it's important to understand that these projects are necessary and will have to happen—whether firms like it or not. wt

Plus ça change

The pace of change—in politics and in fintech—over the past few years has been breathtaking. Jo finds out at NAFIS, however, that some things never change.

I have only recently returned to *WatersTechnology*, after a couple of years away covering another beat for our sibling publication, *Risk.net*. That means I haven't exactly been keeping abreast of many of the tech changes that have happened to the markets we cover. In some ways, I feel as though I've been asleep, and I'm now waking up and coming down from the mountain, like a fintech Rip van Winkle.

Washington Irving's protagonist returns from his decades-long slumber to find that the American Revolution has occurred and he is now a citizen of the free United States. I missed no revolutions, exactly. Though there have been many in the industries we cover, from cloud computing to artificial intelligence, they were well under way in my time at *Inside Reference Data*.

These revolutions have in many ways become 'business as usual' over these last few years. And some revolutions that were promised have petered out into nothing much at all.

A Flat Circle

In 2015, I was in Singapore covering the annual Sibos conference where the sessions on blockchain were packed out. Distributed ledger was a sexy new tool on the lookout for a use case. In 2019, it's still on the lookout for a use case—but it's not so sexy anymore.

Artificial intelligence, however—the science that once sounded like science fiction—has matured into a genuinely exciting new set of disciplines in financial services. AI isn't new in finance and it's ubiquitous, but the past few years have seen increasing discussion about techniques that go beyond the commonly used subsets of machine learning and natural language processing. Rarer models, like evolutionary programming, may find new uses as financial institutions look for automation and improved forecasting.

All of this technological change is set against the backdrop of a world that is changing extraordinarily fast with genuine political revolutions. It's so common to be acculturated to the accelerating news cycles and hype cycles that to stop and think about how much the planet has altered in the past three years can be dizzying.

> To stop and think about how much the planet has altered in the past three years can be dizzying

We are coming up on the three-year anniversary of the night when I was in a pub in the north London borough of Islington watching on the big screen, along with a load of other anxious Londoners, as Sunderland became the first district in the UK to vote to leave the European Union. Brexit still hasn't actually happened, but even if it doesn't, the landscape of finance—and the world at large, for that matter—will never be the same again.

Regulation, too, has undergone major shifts in the past two to three years. In Europe, Mifid II is fully live. The General Data Protection Regulation (GDPR) is a year old and has forced institutions to consider privacy and consent as never before. In the US, president Trump's deregulatory administration has had a go at post-crisis regulations—tailoring or gutting them, depending on which side of the aisle you are on.

And so I was feeling rather disconcerted when I attended this year's North American Financial Information Summit (NAFIS). One of our keynote speakers was Jonathan Carroll, chief information officer at the Bank of Montreal.

Carroll began by asking the delegates why no one really knows their data. Other industries—such as aerospace, or consumer goods—could never operate like that.

"Imagine going to Walgreens and buying Tylenol tablets. Would you buy Tylenol if there was a one in 10,000 chance there could be a cyanide pill in there? No! Yet in the financial services space, how often are we doing reruns and corrections on the data?" he said.

Carroll's point was that the capital markets have struggled to achieve the data holy grail: Timely, accurate data flowing across the organisation with clear lineage and governance, sliced in different ways for multiple purposes and multiple geographies, reconciled across the board.

Immediately, I felt right at home. Carroll could have been speaking in 2016—or indeed, perhaps, in 2006. His message was as timely now as it was then. Good data management is key—and it's still elusive.

Some things never change. wt

Wei-Shen Wong

Pieces of the Pie

Bloomberg's SSEOMS will dissolve by April 2021, which means its clients are on the prowl for alternatives. Wei-Shen highlights one of those companies looking to fill the gap, and what it might mean for the industry as a whole.

Firms using Bloomberg's Sell-Side Execution and Order Management Solutions (SSEOMS) have until April 2021 to find a new platform provider. About two months ago, the tech giant said that it was exiting two key lines of business: its SSEOMS unit and its Know-Your-Customer (KYC) business, which includes Entity Exchange and Entity Intelligence.

The KYC space is saturated and difficult, so it wasn't a huge surprise to see Bloomberg back away from that sector. While order and execution management (OEMS) is hot as ever, sell-side firms are no longer looking for an equity-specialist OMS, which is what SSEOMS is; rather, they want a multi-asset-class platform that can handle more complex functions. For that, Bloomberg has its Trade Order Management Solutions (TOMS) unit to fill the void.

Enter Itiviti

But Bloomberg's exit does open the door for others to poach clients of SSEOMS who perhaps are not as excited to jump on the TOMS bandwagon, for one reason or another. One vendor that has been pretty vocal and open to helping Bloomberg's clients migrate over to its own multi-asset OMS is Swedish trading and technology provider Itiviti.

As an example, it recently brought on former regional manager and head of sales and services for Asia-Pacific at Bloomberg, Frederic Villain as its new head of agency trading sales for Asia.

Villain most recently oversaw Bloomberg's SSEOMS business for the Asia-Pacific region. He will assist in executing Itiviti's overall strategy in the sell-side OMS arena.

Itiviti's newest hire is in line with what CEO Robert Mackay told *WatersTechnology* in a recent interview. Mackay said the company is working on building out its capacity to better handle migration projects. Although in the past it has migrated several of Bloomberg's clients over to its own OMS, it isn't taking any chances. It is for this reason that Itiviti is actively recruiting Bloomberg employees who have worked on SSEOMS.

> While there's great value in being a company that can cover the full trade lifecycle end-to-end, it's also easy to create something of a hodgepodge of services that end up dragging on a company's future plans.

"We'll be getting a variety of talent from the SSEOMS organization into those roles," he said. While he added that some of Bloomberg's SSEOMS' staff have already found roles within the same company, Itiviti is open to onboarding as many SSEOMS staff as possible. *(See page 4 for more information on Itiviti's plans.)*

New Blood

As you've probably heard before, Isaac Newton's Third Law is that for every action, there is an equal and opposition reaction. Other big tech firms are likely to follow Bloomberg's footsteps and look to streamline their product offering. While there's great value in being a company that can cover the full trade lifecycle end-to-end, it's also easy to create something of a hodgepodge of services that end up dragging on a company's future plans.

For Bloomberg, KYC doesn't offer much value as a revenue stream, as the space already contains many players—including Refinitiv, LexisNexis, Dow Jones, Bureau van Dijk and IHS Markit—and it's often still labor intensive, even after technology has been applied.

And as for the sell-side OEMS space, Bloomberg has TOMS, so the value of SSEOMS, as a hardcore equity OEMS platform—and there was a time when that was appealing—is no longer ideal.

Itiviti sees an opening. They're hoping that TOMS might not be appropriate for everyone, and they're happy to nibble around the edges in an attempt to win new business. And they seem to be playing it smart—they're not publically bad-mouthing Bloomberg in any way, they're just trying to show that there are other options and that the buy side doesn't need to be locked in.

Itiviti won't be the only company looking to create new business off of this event. It makes sense. The challenge will be in the execution of the plan. For that, we'll have to check back in about a year. wt

Raising the Standard(s) for Alt Data

With alternative data on every firm's agenda, Max looks at efforts designed to make it easier to integrate new data sources into investment strategies, and why standards for alternative data represent an important step forward.

There's a reason data professionals aren't known for their success at office politics: Anyone with political ambitions of any sort generally needs to be willing to bend the facts to suit their agenda. In contrast, those who operate in the market and reference data industries are, by and large, sticklers for accuracy, charged with preserving golden copies of the truth about an instrument or a company.

So-called "alternative data"—datasets originally developed for use outside the financial markets, or which emerged as a byproduct of other activities, but which serve as an indicator of price movements, or factors such as sales or supply and demand that would affect a company's balance sheet or the price of an asset—is the topic du jour, but is a new area for many data managers.

But with so many new data types—and providers—how can you be sure that you're picking the right source of alt data?

One option is to introduce standards, much like the easy-to-read nutritional information labeling found on pre-packaged foods around the world that enables consumers to compare apples to apples (or perhaps, apple juice to apple "juice drink"). This way you can find out which foods are heart-healthy or not, and which will spike your blood sugar.

These standardized tables are so important because the front of food packaging is taken up with mouth-watering imagery and marketing terms that have little meaning. While foods claiming to be "organic" or "non-GMO" must live up to certain standards, terms like "all natural" can hide a multitude of sins. Calling a snack "high protein" is useless if it also has five times as many carbs as something with slightly lower protein. Or calling a granola bar "heart-healthy" is misleading if the sodium content reveals a mountain of salt.

In the world of financial data, there are different approaches to this: One is to come up with proxy measures that demonstrate the value of a dataset. For example, alternative data analytics provider Lucena Research has recently partnered with events data vendor Wall Street Horizon to create trading strategies that combine WSH's alternative data with Lucena's predictive analytics. Lucena's Wall Street Horizon Short strategy (based on firms' postponing of their earnings dates) outperformed the market by almost 25% during its first two months of tracking the data between February and April this year. The strategies are an example of how vendors can demonstrate the value of their proposal, and also the suitability of data for a client's specific investment strategy—for example, a long equity fund won't want data whose greatest returns transpire when used in short strategies.

The other approach—one proposed by asset managers and being facilitated by data industry association FISD—is to create a basic set of standards and formats that guide how alternative data providers should approach potential clients among financial firms. These include "tear sheet" templates for how a company describes itself and its dataset. These are useful because firms know what they're buying, and have a better idea of what to expect before investing months of time and effort testing the data and analyzing the results—not to mention the cost of a good data science staff—only to realize it may not be suitable.

At the moment, firms wanting to ingest alternative data from multiple sources with different formats and delivery mechanisms either need to integrate those disparate datasets themselves, or rely on aggregators, such as Bloomberg and FactSet, which are each pushing hard into this space. However, the FISD initiative reflects that firms don't like being locked into the aggregator approach, and would rather control what they consume, and have some input into how vendors approach them.

In fact, the inevitable changes to licensing procedures that may come about as a result of the alternative data movement may yet have a positive influence on how mainstream data vendors approach potential clients. Many vendors already foster their own user groups, and there's a reason for this—if they don't, someone else will, and that feedback can be valuable to creating something truly unique. So maybe the user-defined vendor isn't far off. wt

Human Capital

Former SEC Commissioner Kara Stein Joins IEX Board

Former SEC commissioner Kara Stein has joined the board of directors at the Investors Exchange (IEX).

As an IEX board member, she will help improve transparency for public companies and investors as the company strives to develop new technologies and foster new standards for performance in the marketplace.

Appointed as an SEC commissioner by former President Barack Obama in 2013, Stein has advocated for investor protections, updating the commission's rules to put investors first and to enhance the securities market structure.

Prior to being an SEC commissioner, Stein was staff director of the Securities, Insurance and Investment Subcommittee of the US Senate Committee on Banking, Housing, and Urban Affairs.

Finastra Hires Mark Miller as Finance Chief

Finastra has appointed Mark Miller as its new CFO.

Kara Stein

Tim Dinsdale

Miller brings 25 years of experience in technology, finance, and operations to Finastra.

He was previously CFO at marketing automation software provider Marketo, which was bought by Adobe in September 2018.

He also spent 18 years at travel technology firm Sabre, where he held various positions, including CFO.

Miller also served in various functions at Active Network, a portfolio company of Vista Equity Partners.

Miller will be based out of Finastra's London headquarters and will report to CEO Simon Paris. He will also join the company's executive leadership team. He is replacing Rob Binns, who decided to step down after serving three years as Finastra's CFO.

Paris said in a statement that Miller's strategic planning experience will be crucial as the company continues to release new technology.

OpenFin Appoints Former Goldman Sachs MD Tim Dinsdale European CTO

OpenFin has announced that Tim Dinsdale has joined the firm as European CTO.

Reporting to OpenFin president and COO Chuck Doerr, Dinsdale will be responsible for leading the firm's technology efforts across the region. He will focus on expanding the company's London-based development team and driving OpenFin's desktop services globally, including OpenFin Layouts.

He will continue to support the development and adoption of the FDC3 standards initiative, initially launched by OpenFin and contributed to the Fintech Open Source Foundation in 2018.

Prior joining OpenFin, Dinsdale was a managing director at Goldman Sachs. During his long tenure there, he worked in a variety of technology roles in the front and middle offices across the equity structured products desk, the core strategies group and the enterprise platform group. Before entering financial services in 2003, Dinsdale worked in the gaming industry as a software engineer.

Baker Signs On as CTO at MarketAxess

New York-headquartered fixed income platform MarketAxess has tapped Michael Baker as its new CTO. Baker will oversee all software development for the company globally, including strategy, architecture, and deployment of the company's trading system.

He will focus on the evolution of the firm's next generation of technology solutions.

Baker hails from Fidelity Investments, where he spent two years as head of enterprise cloud computing and led the company's transition to the cloud. Prior to that, he served as a managing director and head of high-frequency trading, asset management structure and engineering for Citadel Investment Group.

In his new role, Baker will report to CIO Nick Themelis. He will be based in New York, where he began his career as a software engineer for Salomon Brothers in 1994.

Nick Carmi Moves to BitGo

Digital asset company BitGo has appointed Nick Carmi head of financial services.

Carmi joins BitGo from Tower Research Capital, where he was global head of the FICC business.

Carmi has 25 years of experience

as a Wall Street executive. As global head of FICC for Tower Research Capital, he ran the firm's FX and fixed income businesses and was responsible for oversight of operational risk, prime broker leverage and counterparty trading limits, developing access to new products including non-deliverable forwards and cryptocurrencies.

Carmi joined Tower from SpreadZero, a dark pool business for fixed income securities. As CEO, he expanded the firm into Europe and Asia. He has also worked at Barclays, Lehman Brothers and UBS.

He now reports to BitGo CEO Mike Belshe.

Andy Bose Joins PanXchange Advisory Board

Over-the-counter physical commodity exchange and price-discovery platform PanXchange has announced that Andy Bose has joined its board of advisors.

Most recently, Bose was a senior leader at S&P Global Platts, with responsibilities for P&L, innovation and new products servicing physical commodity price markets. He previously held product innovation and operations roles at S&P Global's ratings and market intelligence divisions.

He began his career in aerospace engineering and holds a degree in computer science and electrical engineering from Princeton University, as well as an MBA from NYU Stern.

FIA Names Bruce Savage Head of Europe

The Futures Industry Association (FIA) has named Bruce Savage its new head of Europe. Savage will join the association in the summer.

Savage has spent 21 years with Deutsche Bank in a variety of roles. Most recently he was the bank's global head of regulatory affairs and market structure, listed derivatives and markets clearing.

He has served on the FIA's board of directors and is a member of the European Regional Advisory Board.

In this role, Savage's responsibilities include heading the FIA's European operations, leading the European regional advisory board and advocating the FIA's concerns to the UK and European regulators and supervisors. Based in London, Savage will work alongside Emma Davey, the FIA's chief commercial officer, to oversee staff in London and Brussels.

Savage replaces Simon Puleston-Jones, who resigned earlier this year.

NASDAQ NAMES DILLARD HEAD OF GLOBAL INFO SERVICES

Lauren Dillard, formerly the head of investment solutions at the Carlyle Group, has been named Nasdaq's head of global information services, which provides benchmarks and market data solutions across multiple assets and regions.

Dillard will replace Bjørn Sibbern, who will move to the role of president for European markets.

Dillard will be based in New York, while Sibbern will serve in Stockholm. Dillard will be responsible for growing Nasdaq indices globally and expanding global information services, particularly in investment analytics and alternative data, as well as increasing market access for new investors, according to the exchange operator.

Dillard has spent the previous 17 years at the Carlyle Group, where she managed more than $40 billion in assets across six countries.

She will assume her new role on June 17.

Lauren Dillard

William Cohee

Rob Ord

3Forge Founder Joins Trade Informatics as CIO

Jerome Downey has joined Trade Informatics as CIO.

Downey has more than 30 years of experience in high-speed trading and capital markets technology. In his previous roles, he served as CIO of Helios, senior managing director at Bear Stearns, and global head of cash equities technology at JP Morgan Chase before founding 3Forge.

Greenwich Analytica Taps Ex-Bank IT Exec Cohee to Lead Finance Practice

Analytics and data management provider Greenwich Analytica has hired William Cohee as executive director of financial services.

Cohee was most recently data quality manager within the chief data office at HSBC Global Banking and Markets. Prior to that, he was director of foreign exchange rates and credit IT at UBS Investment Bank, before which he was director of IT at mortgage and real estate market risk solutions provider Clayton Holdings.

Prior to that, Cohee held senior IT roles in fixed income, rates, and credit markets at BNP Paribas, JP Morgan Chase, and Deutsche Bank.

OTPP Taps Ord for Enterprise Data Role

Data management veteran Rob Ord has joined the Ontario Teachers' Pension Plan as director of enterprise data platforms, responsible for overseeing the organization's enterprise data platform capabilities that support its asset management business.

This includes oversight of architecture, modeling, data acquisition and reporting, and for collaborating with developers and business staff to produce solutions for portfolio management, compliance and fund reporting activities.

Ord was most recently director of valuation product control at BMO Financial Group, prior to which he spent seven years at Scotiabank as director and head of data management.

Before that he was director and partner at data management consultancy LakeFront Data Ventures. Ord also spent a decade working alongside LakeFront co-founder Dale Richards at SunGard, where Ord was VP of enterprise data management. wt

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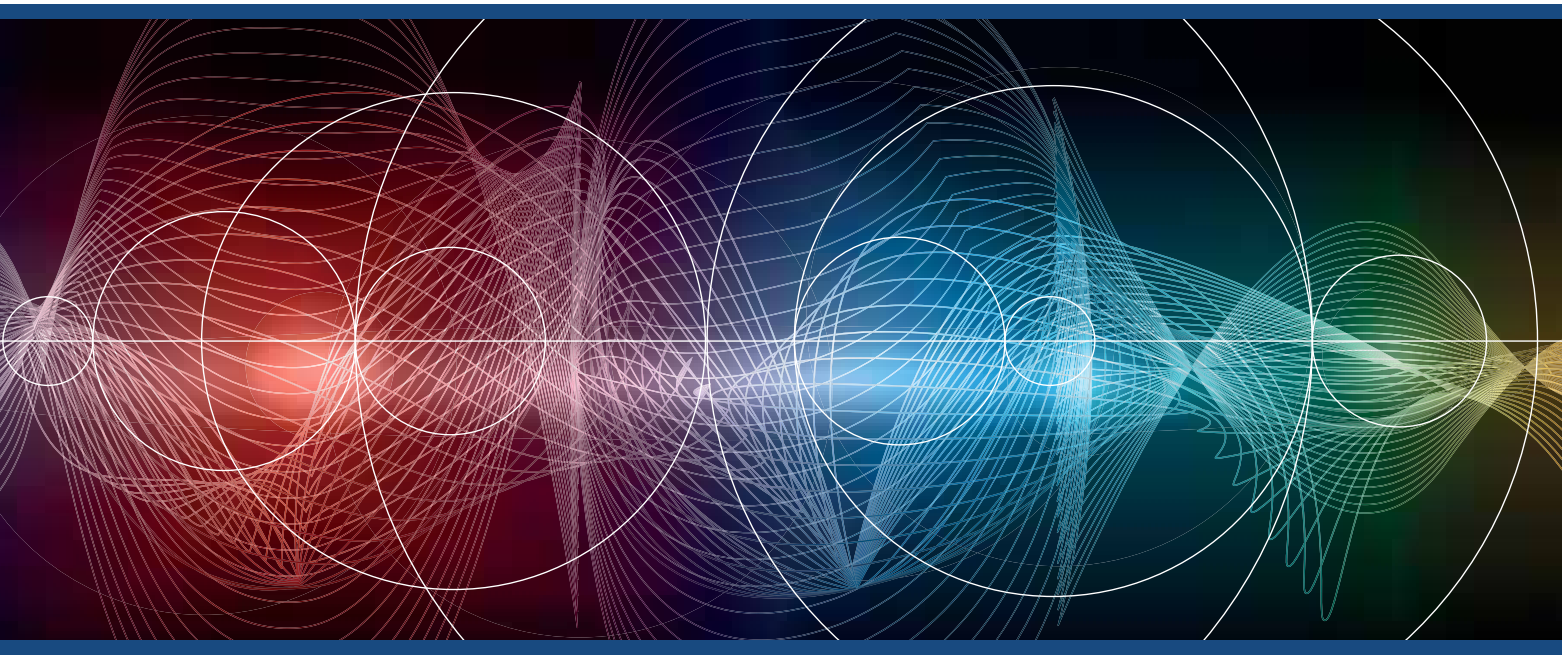

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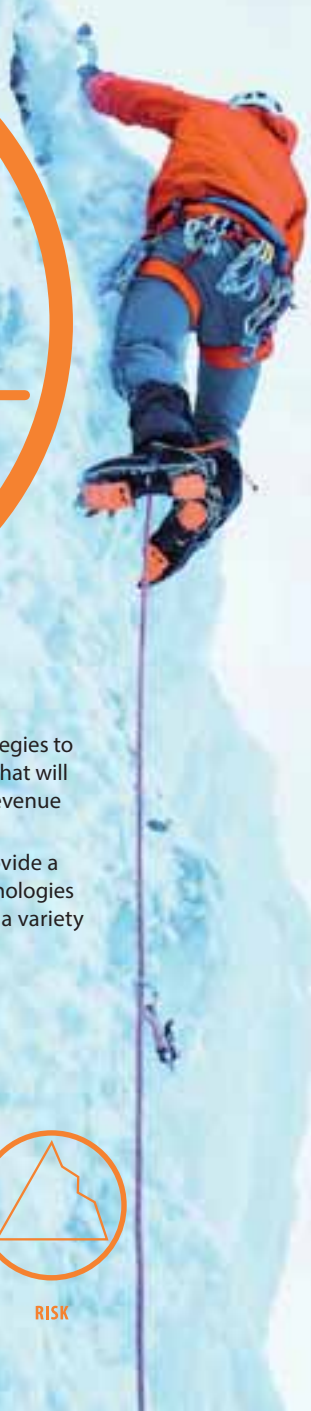

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